MAR 8 1918

MACHINERY ISSUE

THE IRON TRADE REVIEW

Single Copies 15 Cents | CLEVELAND, MARCH 7, 1918 | Four Dollars a Year

A and L INTERIOR WOOD BLOCK FLOORS

Extract from Standard Specifications

SUBGRADE — shall be thoroughly rolled or tamped to prevent yielding.

CONCRETE BASE — the minimum thickness shall be 3" and shall be increased in thickness depending on the loads the floors shall carry. It shall be brought to a smooth surface insuring a uniform bearing for the blocks.

PITCH BED — a coat of coal tar pitch of 130° melting point shall be applied to the surface and distributed by rubber squeegee.

BLOCKS — shall be air-dried long-leaf yellow pine, square edge and sound.

CREOSOTE OIL — must be a pure distillate obtained entirely from coal gas or coke oven tar.

LAYING OF BLOCKS — shall be laid on the cushion with the grain of the wood vertical, in straight parallel courses and rammed both ways to insure tight joints.

Our booklet "FLOORS" shows many typical installations and gives the experience of many users. Gladly sent on request.

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Advertisers' Index, pages 210-211. Contents, page 111. "Where-to-Buy," page 122.
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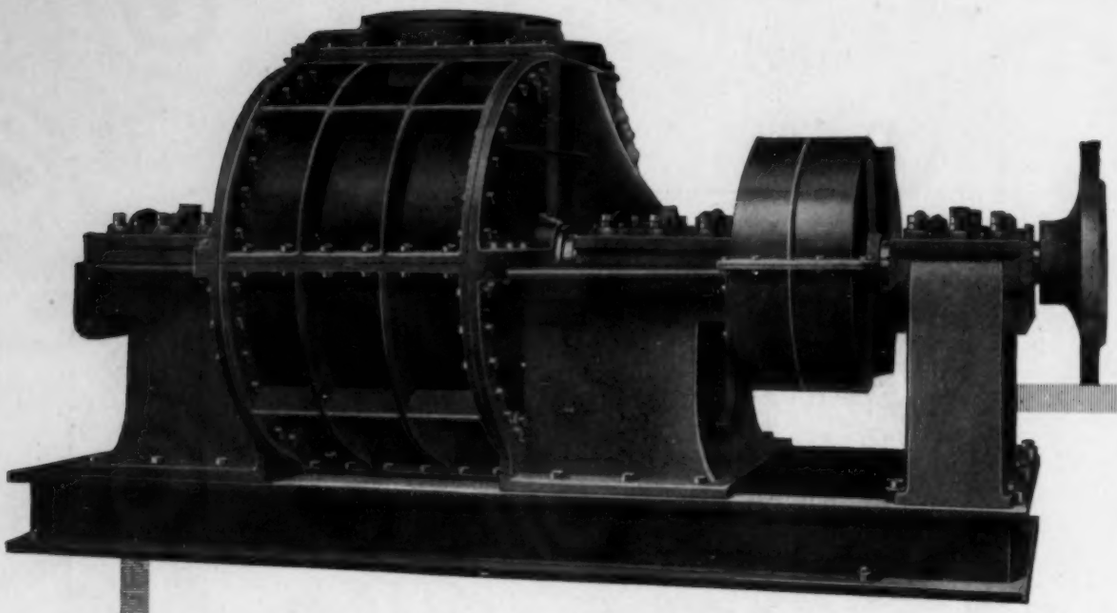

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NEW YORK
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THE IRON TRADE REVIEW

Vol. LXII Cleveland, March 7, 1918 *No. 10*

Price Questions Concern Industry

Higher Maximum Levels Agitated by Producers in Certain Lines as Necessary to Cover Increased Costs—Plates Figure Prominently in This Movement—Government Appealed to by Basic Iron Consumers to Provide Tonnage

PRICE matters again are commanding the chief attention of the iron and steel industry as April 1, when the present schedules expire, draws near. Earnest consideration by government authorities of the higher producing costs in certain lines is being urged by the works. At a general conference of iron and steel makers at New York the past week, discussions centered strongly on this factor. Certain mills, which are buyers of pig iron or semifinished steel, have been leading the movement for advanced prices for their finished product which they declare are necessary to enable them to meet their rising costs. In plates especially there has been much dissatisfaction with the present price of 3.25c at which is claimed but few mills are able to show a profit. If any urgent pressure is to be made on the government for higher prices, it is expected to be in this product.

Appeal to Government

Shortage of the market supply of pig iron apparently is bringing closer increased government supervision of blast furnace operations. The question is being put squarely up to Washington authorities by the appeal of important steel works buyers in Pittsburgh and Ohio territory who are producing war essentials. These consumers, unable to cover future needs totaling more than 100,000 tons, have petitioned those charged with the distribution of raw materials that specified producers be directed to change to basic in their behalf, certain furnace capacity now on foundry iron. The complications of such a move are suggested by the fact that the furnace in view is sold up on foundry iron for the current year, much of which is for war purposes. The growing seriousness of the pig iron situation as aggravated by recent losses of production is being given fresh recognition weekly both within and without the trade. Curtailment of building operations has been advocated by the steel director as one means of conserving pig iron for more essential steel requirements. Heavy inquiry for iron is being maintained, but sales are being held back because the order books of various merchant furnaces are filled far ahead. In the south some inquiry for 1919 delivery has appeared.

Seller Must Pay Broker

If commissions are to be paid on pig iron transactions the director of steel supplies has ruled that they must come from the producer or seller and not from the consumer. The latter is not expected to pay more than the maximum price fixed by the government. The question of commissions also continues to agitate the scrap trade. Brokers are holding back on negotiations until a ruling on this point has been made by proper authority.

Recovery in the production of pig iron after the recent sweeping curtailment has been accelerated by more favorable weather conditions. This is illustrated by the 319 furnaces which were in blast the last day of February against 294 in January, a gain of 25. The average daily output of the furnaces in February was 82,734 tons compared with 77,523 tons in January. The totals were 2,316,545 tons against 2,403,227 tons, respectively, the discrepancy being due to the shorter month just past. The statistics show that steel works stacks have been able to regain lost output more rapidly than the merchant furnaces. Coke shortages still restrain pig iron production. Providing an adequate supply of cars for the Connellsville region remains a stubborn problem. This week service ranged from 38 to 55 per cent on different lines.

War Orders Are Heavy

New government orders of large tonnage are in sight. For the expected contracts for 150,000 cars and 2500 locomotives, probably 1,500,000 tons of steel will be needed. Large rail orders to be bought by the government also are expected. An inquiry for 183,000 tons of shell steel is current. A new ordnance bureau in France calls for a heavy tonnage of fabricated material of which one shop will furnish 15,000 tons. Powder plants being placed call for 20,000 tons further, some of which has been distributed.

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Why Restrict Highway Improvement?

EACH passing hour finds a new committee organized at Washington for the purpose of regulating, supervising or restricting some activity that has a bearing on the conduct of the war. The efficient work of some of these committees has been a marked credit to the judgment of their membership, but in other instances the results have failed to measure up to constructive standards.

Recently an advisory committee to the capital committee of the federal reserve board was named. This latter body will pass upon all bond issues for highway improvement and it is reported it will refuse to sanction those roads which do not assist in the movement of troops or war supplies. The intention is to avoid the issuance of a large number of bonds which will compete with the government for capital, and which will offer higher rates of interest to the investor. The intention is good. Capital should be consecrated to war use. But there is a serious danger, if the interpretation of the powers of this committee is made so broad as to obstruct the construction of all save strictly military roads and streets.

Transportation is vital. The winter's bitter lesson is still pounding this fact upon public attention. We must have transportation or every element of production both agricultural and commercial is useless. During the crisis in railroad affairs when the vital elements of industry were tangled at the transportation centers or piled high at the shipping points awaiting cars, the council of national defense called upon the motor trucking facilities of the country to aid in handling all classes of materials over hauls not exceeding 200 miles. An appeal was made to state and national road commissions to lend their energies in providing roads for this freight relief work. The response was instant and every effort was made to speed up necessary road and street construction. Encouragement was given to motor truck freighting in many states. Among others Connecticut organized a bureau with branches in the principal cities to handle the details of return loads and to arrange routes for regular truck schedules.

The capital issues advisory committee has not progressed far enough in its activities to warrant an opinion as to its policies, but a source of danger exists which should be avoided at any cost. Care must be taken that really necessary and useful road work be not hampered. The average distance which each soldier sent abroad is transported has been stated tc be 1200 miles. Munitions, food and supplies will probably average in the raw or finished state a distance equally as great. This enormous ton-mileage must be carried by the railroads under impending conditions of restricted and diminishing labor supply. The result is that other transportation agencies, motor truck freighting in particular, must be developed quickly and thoroughly to take care of the light and short haul burden. This development must be preceded by road construction and road maintenance, which it will require bond issues to finance. Careful discrimination must be exercised by those who have power to regulate these matters in order to avoid hampering the nation's best interests as well as genuine public advancement. Road construction, particularly trunk line improvement, for which the need is clearly shown, should be encouraged in every possible way.

Overdoing Specialization in Skill

DUE to the great scarcity of skilled machinists needed in the prosecution of the country's vast war program, attention is being called as never before to the American methods for training this highly important class of artisans. Twenty years ago an apprentice in order to obtain his machinist's papers, had to have a practical working knowledge of virtually every type of machine tool. Under the present quantity production methods of American manufacturers, the novice is developed into a specialist. He is taught to know one machine well, in most instances, to the exclusion of all others.

As a result, America's huge war machine now is working under considerable handicap. In the aviation service, where thousands of machinists are enrolled the government is having great difficulty in developing men to care for the repair and upkeep of airplane motors. In one aviation camp, 2500 machinists were recently found unsuited for this work due their lack of the broad, general knowledge of machinery which was required. Another instance, reflecting this great scarcity of skilled machinists, is to be found in the railroad industry. Large numbers of locomotives and other rolling stock are standing idle awaiting repairs, owing principally to difficulty in obtaining men for this work.

This problem not only has its national aspects in a wartime, but also has particular application to individual manufacturers. In the automobile industry, for example, where quantity production has been attained to a marked degree, sharp competition has

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developed the fact that the more successful manufacturer is he who can satisfactorily repair as well as produce at the lowest possible cost. The necessity for conserving as well as producing thus reflected is developing more all-around machinists in the automobile field. Manufacturers in other industries, too, most likely would derive much benefit from the development of some all-around men in their shops as well as the specialists. It is not wisdom to allow our enthusiasm for lower costs and increased sales through quantity production to carry us too far into specialization with the resultant gradual extinction of the machinist's art in its broader and general application.

Production Costs Mount Rapidly

MANUFACTURER'S costs are rising, even in industries where material prices are fixed and wages, fairly stationary. This has been the experience of machine tool builders in recent months. Railroad congestion has been one cause of a considerable item of expense. For example, builders have had much trouble in getting shipments of steel castings through from foundries, even for government work of the highest importance. These manufacturers have been forced to send men to Washington for shipping permits and to employ others to follow up cars and keep them moving. In one case, about a month ago, two cars of steel castings were shipped from a foundry; the first in the regular manner, but the second with a man in charge. The second arrived in due time, enabling the builder to proceed with his government work, but the first is still on the road. The expense involved in following up the car in this case was $250. Then, delays experienced in receiving necessary parts for large machines already on the assembly floor is another source of expense. For example, a builder needed a large machine in his shop for building tools needed for war work. Four motors were ordered for this machine 13 months ago and to date only three have been received. The motor manufacturer now is turning over every motor made to the government under priority orders. In the meantime, the machine in the builder's plant is taking up valuable assembly-floor space, which figures in the "overhead". These instances illustrate only a few of the numerous ways in which incidental expenses are climbing, each comparatively small in itself, but contributing to a large aggregate. Prices of machine tools have been almost stationary since October, due largely to the high level which they have already reached. But there are indications that further advances in prices of some types may be forthcoming before long.

Wanted—Sensible Inspection Methods

FROM time immemorial government inspection of manufacturers' products has not only been strict and exacting, as it properly should be, but insistent upon the observance of the minutest letter of the specifications. Today, although the inspection forces of the various government departments have been augmented by veritable armies of new men, the old, rigorous demand for the observance of standards that are almost absurd, when viewed from a commercial standpoint, seems to prevail throughout the entire range of our wartime production activities. In fact, many of the new government inspectors are so ignorant of their work that they cannot do otherwise than blindly follow the literal wording of the specifications placed in their hands. Instances are on record where inspectors of steel castings were so uninformed on this branch of the foundry business that they were unaware that small defects in such castings could be readily and effectively made good by oxy-acetylene or electric welding. The Emergency Fleet corporation has placed orders for a great many marine engines and is pressing for deliveries. Yet there is at least one foundry in the state of Ohio where there are several large cylinder castings out in the yard waiting for the skull-cracker ball that would now be in the machine shop were it not for the petty exactions of certain subordinate inspectors. The cumulative effect of this maladministration of our inspection service is delayed production and shortage of important materials.

By this it should not be inferred that any brief is held for slipshod or unsatisfactory work. But there is no reason why, in the present emergency, when production is the primary desideratum, commercial standards that have proved entirely satisfactory for the most important work of our largest corporations should not prevail and be entirely suitable to the government. This applies particularly to work of an ordinary commercial character such as marine engines, cars, locomotives, etc.

The government needs businesslike inspection methods which will insure the maximum production of equipment of standard, acceptable, commercial quality. In inspection work, as elsewhere, red tape must be cashiered if we are to win the war.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 638

PIG IRON

Bessemer, valley	$36.30
Bessemer, Pittsburgh	37.25
Basic, Pittsburgh	33.95
Basic, eastern Pa.	33.00
Basic, Buffalo	33.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
Malleable, Philadelphia	34.00 to 37.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicos.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	36.40
No. 2 southern, Chicago	37.50
No. 2 southern, Phila. del.	38.30 to 39.40
No. 2 southern, Cleveland	37.50
No. 2 southern, Boston	39.50
No. 2 southern, St. Louis	35.90
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	36.77
Virginia, No. 2X, Jersey City	37.02
Virginia, No. 2X, Boston	37.27
Gray forge, Pittsburgh	32.95
Silveries, 8 per cent, furnace	46.00
Silveries, 8 per cent, Chicago	48.54
Low phos. standard, Phila.	55.00 to 56.00
Low phos., Lebanon furnace	50.00
Low phos., Pittsburgh	53.00
Charcoal, Superior, Chicago	37.50
Charcoal, Superior, Buffalo	39.75
Charcoal, southern furnace	43.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Wise county furnace	6.00
Pocahontas furnace	6.00
New River foundry	8.00
New River furnace	7.00
Wise county foundry	7.00

FERROALLOYS

Ferromanganese, delivered	$250.00
Spiegel, 20 per cent fur	60.00
Spiegel, contracts, furnace	60.00
Ferrocarbon titanium, carloads, maker's plant	160.00
Ferrosilicon, 50 per cent, first quarter, Pittsburgh	175.00 to 180.00
Ferrosilicon, 50 per cent, Pitts., remainder of 1918	155.00 to 175.00
Bessemer ferrosilicon, 9 per cent	$54.00
Bessemer, ferrosilicon, 10 per cent	55.00
Bessemer ferrosilicon, 11 per cent	58.30
Bessemer ferrosilicon, 12 per cent	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	50.50
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.00

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pitts.	2.90c
Sheared skelp, Pitts.	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chgo.	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.095c
Bars, soft steel, Phila.	3.085c
Bar iron, Chicago	3.50c
Bar iron, Phila.	3.50c to 3.685c
Bar iron, Cleveland	3.64c to 3.70c
Bar iron, New York	3.695c
Bar iron, Pittsburgh	3.50c
Hard steel bars, Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	4.80c to 4.90c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh	3.95
Polished staples, Pittsburgh	3.65
Galvanized staples, Pbgh.	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain, ¾ in. proof coil, Pitts.	8.00c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

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SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.215c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.465c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.465c
No. 10, open-hearth, Phila.	4.435c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base Pittsburgh	Black Per cent off	Galv. Per cent off
¾ to 3 in., butt, steel	51	37½
¾ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

(Class B Pipe)

Four-inch, Chicago	57.30
Six-inch and over, Chicago	54.30
Four-inch, New York	58.35
Six-inch and over, N. Y.	55.35
Four-inch, Birmingham	52.00
Six-in. and over, Birmingham	49.00

HOOPS, BANDS, SHAFTING

Class A pipe is $1 higher than Class B.

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	2.90c
Shafting, Pitts., carloads	17 off to list

RIVETS

Structural rivets, Pittsburgh	4.65c
Boiler rivets, Pittsburgh	4.75c
Rivets ⅞ in. and smaller, Pitts.	45 and 10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semi finished hexagon nuts ⅝ in. and larger	60–10–10 off
Cold pressed semi finished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products March 6, average for February, 1918, average for December, 1917, and average for March, 1917. Prices are those ruling in the largest percentage of sales at the dates named

	Prices March 6, 1918	Average prices Feb., 1918	Dec., 1917	Mar., 1917
Bessemer pig iron, Pittsburgh..	$37.25	$37.25	$37.25	$37.45
Basic pig iron, Pittsburgh....	33.95	33.95	33.95	32.85
*No. 2 Foundry pig iron, Pitts.	33.95	33.95	33.95	36.55
*No. 2, Foundry pig iron, Chi.	33.00	33.00	33.00	35.70
Lake Superior charcoal, Chicago	37.50	37.50	37.50	37.55
Malleable, Chicago	33.50	33.50	33.50	35.70
**Southern, No. 2, Birmingham	33.50	33.50	33.50	28.00
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	36.00
Basic, eastern Pa.....	33.00	33.00	33.00	34.50
**No. 2X Virginia, furnace....	33.50	33.50	33.50	34.00
**No. 2X foundry, Philadelphia	34.25	34.25	34.00	37.25
Ferromanganese, delivered.....	250.00	250.00	247.50	275.00
Bessemer billets, Pittsburgh....	47.50	47.50	47.50	67.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	67.00
Open-hearth sheet bars, Pitts..	51.00	51.00	51.00	67.00
Open-hearth billets, Pitts.....	47.50	47.50	47.50	67.00
Steel bars, Pittsburgh.....	2.90	2.90	2.90	3.20
Steel bars, Chicago.....	2.90	2.90	2.90	3.40
Iron bars, Philadelphia.....	3.50	3.50	3.685	3.509
Iron bars, Cleveland.....	3.64	3.64	3.64	3.00

	Prices March 6, 1918	Average prices Feb., 1918	Dec., 1917	Mar., 1917
Iron bars, Chicago mill.....	$3.50	$3.50	$3.50	$3.00
Beams, Chicago	3.00	3.00	3.00	3.65
Beams, Pittsburgh	3.00	3.00	3.00	3.45
Beams, Philadelphia	3.185	3.185	3.185	3.759
Tank plates, Pittsburgh.....	3.25	3.25	3.25	4.20
Tank plates, Chicago.....	3.25	3.25	3.25	4.60
Tank plates, Philadelphia.....	3.435	3.435	3.435	5.659
Sheets, blk., No. 28, Pitts.....	5.00	5.00	5.00	5.05
Sheets, blue anld., No. 10, Pitts.	4.25	4.25	4.25	4.70
Sheets, galv., No. 28, Pitts.....	6.25	6.25	6.25	6.70
Wire nails, Pittsburgh.....	3.50	3.50	3.50	3.15
Connellsville furnace coke.....	6.00	6.00	6.00	7.60
Connellsville foundry coke.....	7.00	7.00	7.00	6.90
Heavy melting steel, Pitts.....	30.00	30.00	30.00	23.40
Heavy melting steel, eastern Pa.	30.00	30.00	28.75	23.75
Heavy melting steel, Chicago..	30.00	30.00	28.90	23.00
No. 1 wrought, eastern Pa.....	35.00	35.00	35.00	30.50
No. 1 wrought, Chicago.....	35.00	35.00	34.75	28.85
Rerolling rails, Chicago.....	35.00	35.00	35.65	27.25
Car wheels, Chicago.....	30.00	30.00	30.75	20.30

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

(For Additional Prices See Page 638)

Appeal to Government for Basic

Steel Works Unable to Buy Iron Petition Washington to Direct Makers to Change Over Foundry Production in Their Behalf—Unsatisfied Inquiry in Steelmaking Grades Still Piling Up—Furnace Output Better

Pittsburgh, March 5.—Blast furnace interests in this district, which have been selling for that delivery appear to be entirely committed for the last half. Numerous inquiries involving large tonnages have been withdrawn from this market and put out in other producing sections. Evidence that there is going to be a tremendous shortage of iron continues to accumulate and consumers are making vigorous efforts to cover their requirements as fully as possible. Many of them realize they will fall far short of obtaining adequate supplies. One consumer in this district is sounding out the market in the east for a limited tonnage of basic iron for second quarter delivery, but so far has been unable to cover. Another Pittsburgh consumer seeking a round tonnage of basic has closed with a furnace in the west for 1000 tons and is about to complete negotiations for another lot. Some buyers who ordinarily purchase iron in this or nearby districts are sounding out southern markets and tonnages from that section are now being shipped to the Pittsburgh territory. The embargo declared last week by the Pennsylvania railroad on freight originating on lines west for shipment beyond the switching limits of Pittsburgh and destined to the east affects pig iron. This has prevented furnaces from making many deliveries, although where the iron is in pressing need for government purposes, permits are being issued. At the same time this embargo has caused shipments to be made more heavily to other points and no stocks have been piled. Furnace operations have improved during the past week, but some of them are on a day-to-day basis because of the shortage of coke. The Carnegie Steel Co. has in operation 41 of its 59 stacks, the National Tube Co. 9 of 11 and the Jones & Laughlin Steel Co. 7 of 11.

Ask Government to Act

Cleveland, March 5.—A new turn of the market which may be fraught with far-reaching developments is represented by the appeal being made by certain steelmakers to the government authorities that specified merchant furnaces be ordered to make basic iron in their behalf. At least two important steel plants in Pittsburgh and Ohio territory which have essential war business to fill but have been unable to buy their basic in the open market are taking this step. These interests need well over 100,000 tons for the last half. They are proposing that a certain stack now running on foundry be directed to switch to basic. The furnace in question is filled up for months ahead on foundry iron. The action resorted to by these steelworks consumers reflects the acuteness of the shortage of basic iron. New inquiries for this grade continue to appear. A New York state plant wants 12,000 to 15,000 tons for last half as well as 2000 tons of March-April malleable. A Philadelphia foundry interest wants 6000 tons of malleable, 1500 tons of basic and 500 tons of foundry for last half. A steel foundry has continued to sound the market for an indefinite tonnage of basic. Nothing has developed from the inquiry in the south for 72,000 tons of basic by a northern Ohio melter. Leading lake and valley sellers are offering practically

nothing in any grade as they are sold up through the year. Chicago producers will fill an allocation of 15,000 tons of malleable for a car-wheel maker in that territory. Only part of 2000 tons for the same consumer for Boston delivery has been allocated. Furnace operations are improving steadily and some stacks are back to about their November position before the severe weather appeared.

Big Tonnage is Needed

Boston, March 4.—About the only feature of the local pig iron situation is the fact that there is a somewhat freer movement of iron to this territory on government permits to plants engaged in war work. In spite of the improvement in the railroad freight situation and the fact that most furnaces are operating more freely, there is no improvement in the local supply situation. Almost all of the big melters in New England underestimated rather than overestimated their probable needs and if the orders could be placed, it is probably no exaggeration to say that 100,000 tons could be booked within 24 hours. And it would not matter much what kind or grade of iron it was if it could be secured between now and the middle of the year. With the furnace already booked ahead of their probable production for the next few months, however, there is little inclination to accept further orders and even regular customers are unable to budge makers from this position. The iron simply is not available. There are urgent calls for deliveries on existing contracts and in the effort to tide over, there are inquiries for ferrosilicon to take the place of 4 to 6 per cent silicon pig, supplies of which are very short and shipments of which are long overdue. Until the railroad situation clears further and there is a more normal movement of freight, it is probable that deliveries will be confined largely to the iron that is being shipped under a special or government permit and to plants working on war contracts. Recently, the shipping situation was worse in the south than in the north or west but with a special or government permit, which must be secured by the consignees, the only means of getting shipments through, it is as easy to move iron from the south as from any of the other producing regions.

Basic Tonnages Sought

New York, March 5.—Demand for pig iron has been more active again in this district. A New York state melter is in the market for 15,000 tons of basic for the second half and the National Enameling & Stamping Co. is seeking 10,000 tons of the same grade for the same position for Granite City delivery. Numerous inquiries for second half delivery are current and in the aggregate these constitute a large total. The furnaces generally continue to pursue the policy of not quoting for second half delivery and of accepting orders only when practically forced by regular customers to accommodate them. Such sales in this district during the past week did not exceed 10,000 tons and were made up mainly of foundry grades. Other current sales include only small tonnages of off or special analysis iron for prompt shipment.

Last Half Inquiry Heavier

Philadelphia, March 4.—Increased interest in second half iron has been manifested by consumers in this district during the past week through a greater volume of inquiry. One of the largest new inquiries is that from a Pottstown, Pa., consumer who wants 6000 tons of malleable, 2000 tons of basic and some foundry, all for second half. Other new inquiries call principally for foundry and involve a large tonnage in the aggregate. None of the makers, as far as known, are quoting on any more second half business at this time. Much pressure continues to be exerted for iron for shipment prior to July 1, but the only offerings are occasional carloads, mainly off iron. It is expected that a Virginia furnace, which has not yet taken any second quarter iron, will accept some tonnage shortly for this position. Inquiry for basic continues just as active as in preceding weeks, but none of this grade is to be had. Although furnace stocks as of March 1 have not yet been compiled, it is expected that a slight reduction will result from the better shipping conditions which have prevailed of late. It again is possible, for the first time in many weeks, for Virginia furnaces to make shipments to New England.

Much Inquiry is Passed

Buffalo, March 5.—Inquiry for pig iron in this district is considerable but the business being done is not large. The most extensive selling of the week was an aggregate of 7000 tons of foundry iron sold by one interest for third quarter delivery. Furnaces are being importuned for last half product so strong is the demand for this period that one furnace interest has had to refuse to increase orders for last half already given by old customers. One maker continues to be flooded with inquiry for thousands of tons of malleable, basic and foundry, though it has been out of the market, including last half delivery, for months. This furnace has been able to give old customers a very small tonnage. A Depew, N. Y., melter is inquiring for 12,000 to 15,000 tons of basic for last half and for 2000 tons of early malleable. There is prospect that some of the furnaces may be more interested in inquiry within a short time. The fuel situation has improved slightly, though production still is sadly hampered. Contemporaneously there is a freer movement of empty cars, though some of the principal lines are badly tied up. Improvement of iron production waits on the coke situation. A further lifting of embargoes is making shipments easier. The embargoes, in fact, are off to a large extent, except some points in Canada.

Embargoes Are Lifted

Cincinnati, March 4.—The combined efforts of the railroads and the furnace operators appear to have had some effect toward moving shipments to destination more promptly. Nearly all embargoes on southern iron have been lifted, and it is now possible to ship iron to points north of the Ohio river, with very few exceptions. Shipping restrictions as applied to the Ironton district have also been almost entirely removed, but the difficulty now is to obtain cars in which to load the iron. These are scarce and are likely to cause more trouble as iron commences to move in larger volume. The inquiry is falling off, and sales of southern foundry iron are also fewer. Another trouble that has existed for some time, and which is now increasing is the difficulty in obtaining iron with the correct analysis wanted. High sulphur iron in the south is in larger supply than at any previous period. Several melters of northern iron have been quietly taken care of covering a last half supply, but available metal for that shipment is now very limited. No change in the silvery iron situation is reported, although some high silicon iron has recently been disposed of by southern producers, nearly all of which was for last half shipment.

Fearful After July 1

St. Louis, March 2.—Large inquiries and light sales briefly sum up the pig iron situation here. Actual transactions during the present week were the smallest so far this year. Southern makers, it appears, have oversold themselves and will have to address themselves to intensive production in order to meet their bookings. This

week some small tonnages of No. 2 southern were disposed of for second half delivery, but otherwise furnaces in that region have entirely withdrawn from the market. Among the inquiries reported were several for small amounts of Ohio silvery grades but so far as could be learned none is to be had for any shipment. East side foundries and mills are inquiring for fair tonnages of steelmaking iron. Consumption in the St. Louis district continues heavy. The only factor holding operations being the continued scarcity of coke. While most of the important consumers are covered pretty well over the first half, apprehension is felt relative to pig iron supplies from July 1 on. There is a marked hesitancy about accepting business depending on pig supplies after that date.

Southern Inquiry More Active

Birmingham, Ala., March 5.—Inquiries for pig iron are numerous again. Southern furnaces after practically withdrawing from the market for any future period have resumed some selling. Consumers consequently have renewed inquiries for third or fourth quarters. In one or two instances quotations have been asked on next year's delivery. But little, if any iron at all is to be had for the second quarter and the probable make for the third quarter has already been well sold. Some inroads have been made on the fourth quarter tonnage. While production shows some improvement, the output is not what has been expected. The Republic Iron & Steel Co. has not had normal output, coal and coke shortage having caused the deflection. Weather conditions have been almost ideal for steady operations. Railroad service also is better and some of the delayed shipments are being caught up with. Blowing in of additional furnaces is scheduled for the next few days including stocks at Sheffield. The Trussville furnace is still delayed by lack of washed coal. The furnace has been in readiness for 60 days. Home consumption of iron still lags as pipe plants are not melting as extensively as a few months ago.

Want Closer Touch

Chicago, March 5.—The western division of the American Board of Scrap Iron Dealers has voted to send a representative to Philadelphia to make arrangements for keeping the western division closely informed of every development relative to proposed or agreed changes in scrap.

Cars Still Cripple Coke

Despite Urgent Measures Transportation Service in Connellsville Region Far Under Needs—Speed Up Shipments for Low Phos Iron

Pittsburgh, March 5.—Shortage of cars in the Connellsville coke region still hampers shipments and remains at about the same average that it has been for the past two or three weeks. The average for that period has been approximately 38 per cent on the Monongahela railroad, and between 55 and 60 per cent on the Pennsylvania railroad. On Monday of the current week there was a better supply on the Monongahela railroad, but today it dropped to only 30 per cent. The average promised for tomorrow is 40 per cent. The Pittsburgh & Lake Erie railroad is taking care of all requirements for the Monongahela and is said to have placed 125 per cent of its supply yesterday. Producers and consumers alike are unable to explain the unsatisfactory supply of cars and are greatly disappointed at the failure of the free movement of empties back to the coke region. Beginning last Saturday empties started to return from the east and some of them went to the Connellsville region. They, however, would take fuel only for points west, resulting in a more acute shortage for eastern furnaces. A. H. Smith, regional director of railroads of New York, issued an order Saturday directing that priority movement be made of empty coal and coke cars and this is expected to result in a large increase in the supply in the coke region but so far such a situation has not developed. While it is known there is a vast number of cars in the east their rapid return is not expected owing to traffic congestion, together with the lack of motive power. It is claimed there are 25,000 open cars alone in the east waiting to be returned to the west for carrying food products and war materials. Production in the Connellsville region for the week ended Feb. 23 shows some increase as the output was 264,849 tons, as compared with 240,772 tons for the preceding week, according to *The Connellsville Courier*.

Increased prices for coke allowed by the fuel administration last week do not affect Connellsville fuel but relate to ovens on the Baltimore & Ohio railroad between Tunnelton, Grafton, Preston county, Pennsylvania, Meridian, Barbour county, West Virginia, the Pocahontas district of that state and Indiana county, Pennsylvania. The amount of coke commandeered by the fuel administration for the Eastern Steel Co. for low phosphorus pig iron production is 10,000 tons monthly. In addition ovens with contracts with the Northern Iron Co. making low phosphorus iron have been instructed to make 100 per cent shipments.

New Jersey Fuel Sold

Boston, March 5.—New Jersey by-product foundry coke which was fixed by the fuel administration at $9.25, ovens, maximum, has been selling in this territory at $12, delivered. The maximum price of the New England maker is $13.94, ovens, but some sales have been made at $13.45, ovens.

Sell Last Half Fuel

Philadelphia, March 4. — Several thousand tons of western Pennsylvania beehive foundry coke again were sold in this district during the past week for second half shipment. The seller now has withdrawn and the market again is devoid of offerings for any position.

Contracts Are Renewed

Cleveland, March 5.—Connellsville makers of foundry coke have been renewing contracts for last half or for all year to July 1, 1919, with regular customers in this territory. These contracts are subject to subsequent official price revision. One local foundry is inquiring for 25 cars and another for 10 cars.

Supplies Are Better

Cincinnati, March 4.—Changes made in prices on some coke, especially in the New River field, have had no effect. No coke can be had for prompt shipment, and this applies equally to all fields and on all grades. Contract business also is at a standstill, as the producers are very slow in committing themselves to deliver any more fuel than already under contract. Cars are getting scarcer, and delays are to be expected on this account. Both the furnace and foundry supply has improved to such an extent that no plant is expected to shut down for the want of fuel. This does not mean that stocks of coke are approaching normal, but that there is sufficient on hand to run these plants several days ahead.

Permission was recently granted the Brier Hill Steel Co., Youngstown, O., by the federal government to fill the bank of the Mahoning river with a retaining wall as a protection against floods at the tandem plate mill being erected a few miles above the center of the city.

Commissions Check Sales

Scrap Dealers Reluctant to Trade Pending Settlement of Compensation Question—No Ruling Yet Announced—Producers Sell Direct

FOR COMPLETE SCRAP PRICES SEE PAGE 638

Pittsburgh, March 5.—While it has been dull for sometime the scrap market has become more stagnate since the reclassification and the establishment of differentials were announced recently. This situation is due to the fact that brokers and dealers are uncertain as to whether or not a commission is allowable on transactions. Consumers are declining to pay a commission in the absence of an official interpretation making it plain whether or not sellers are permitted to take a percentage over the levels fixed. Dealers in scrap say they are compelled to pay these fixed levels for supplies they obtain and that therefore they cannot do business unless a commission is allowed. In consequence sellers who were offering considerable tonnages of different grades, especially heavy melting steel and low phosphorus scrap, hav withdrawn from the market. At a meeting last night at the Fort Pitt hotel, this city, of the central division of the American Board of Scrap Iron Dealers, C. A. Barnes, secretary of the board and also a member of the subcommittee of the iron and steel scrap committee of the American Iron and Steel institute, said that the matter of compensation for brokers and dealers still is under consideration by the committee on steel and steel products of the institute. The central division at present takes in only Cleveland, Detroit, Cincinnati and Columbus districts. An invitation was extended to dealers and brokers in the Pittsburgh and Erie, Pa., and Buffalo, Rochester and Syracuse, N. Y., districts to join the central division and it is probable it will be accepted. The Pennsylvania took bids on March 5 for 6500 tons of miscellaneous railroad material.

Market More Active

Boston, March 4.—More favorable weather and an easier shipping situation have combined to make a more active market for scrap in this territory. Actually, the market has been active in demand right along, but it has not been until the past week that it has been possible to do much shipping and the local trade is largely dependent on distant consumers for business. Better selling prices evidently prevail for cotton ties, rerolling rails, wrought iron pipe, No. 1 railroad steel, machine shop turnings and drop forge trimmings, for dealers are paying higher prices for those offerings. Wholesale dealers' paying prices per gross ton, f.o.b. shipping points, follow: Wrought No. 1, yard, long, $30 to $31; horse shoes, $30 to $31; cotton ties, $22 to $23; stove plate, $20 to $20.50; No. 1 machinery, $32 to $33; No. 2 machinery, $28 to $29; car axles, iron, $43 to $44; steel, $43 to $44; rerolling rails, $31 to $32; bundled barrel hoops, $17.50 to $18; iron boiler plates, $34 to $35; wrought iron pipe, new specifications, $28 to $29; steel rails, $26 to $27; No. 1 railroad steel, $26.50 to $27; heavy melting steel, $25.50 to $26.50; axle turnings, $21 to $21.50; machine shop turnings, $15 to $16; cast borings, $16 to $17; drop forge trimmings, $23 to $24; cast iron car wheels, mill price, $35 to $37.

Railroads Still Direct

New York, March 5.—With the railroad situation steadily improving, the scrap market in this district continues to reflect a better tone. Dealers report good trading in virtually all descriptions. One development of the past few weeks which now is having a more direct effect on the business of some brokers is the tendency of the railroads to sell direct. It is expected that as time goes on this practice will become more general, particularly in the outlying districts. Under the control of the government, it is believed the railroads will distribute much of their scrap to consumers along their main lines. This would supplant the present method of selling to dealers, delivering the material to their yards at terminal points and eventually carrying it back over the same line to the ultimate consumers. At present demand is of sufficient volume to keep the dealers well booked. Prices generally are firm, except on wrought pipe, which now is holding at $30.50 compared with the previous level of $31.

Buyers Avoid Commission

Philadelphia, March 4.—A growing proportion of the scrap business in this district is being transacted direct between producers and consumers. This development is due to an increasing disinclination on the part of consumers to pay a commission to dealers. Visible sales during the past week, therefore, were mostly by the smaller yards to the large dealers. How much business has been transacted direct is not known. The only price change during the past week was an advance of 50 cents on No. 1 forge and bundled sheet scrap. In general, the market seems somewhat weaker, due to the loosening of the supply of scrap by the more moderate weather. The Pennsylvania railroad has made changes in its methods of selling. It now requires not only a bid f.o.b. the point at which the scrap is held, but the name of the consumer and the equivalent delivered price at the point of consumption. It also desires information as to whether the scrap will be used in a blast furnace, or for chemical purposes, or in a basic or acid open-hearth plant, etc. One result of the regulation of the market is that the Cambria Steel Co., being located nearest the Altoona, Pa., shops of the Pennsylvania railroad, is able to bid a higher price than any other important consumer.

Classify Shell Turnings

Buffalo, March 5.—The market is becoming easier. Consumers appear to be getting scrap and the intensified demand caused by the fact that certain users feared they would not be able to cover all their requirements is diminishing. Little material is coming into yards, however, and in addition to a dearth of railroad and mixed scrap, there is still a shortage of heavy melting steel. It is understood in local scrap circles that a ruling has been made in regard to shell turnings, large tonnages of which now are coming in, by which the government price of $25 for heavy axle forge turnings and their equivalent will include first and second cuts only of shell turnings. The lighter shell turnings are to be classified as ordinary machine shop turnings and will come under the government price of $20. In the event plants do not separate first and second cuts, the output will be classified as merely "machine shop turnings". Large tonnages of shell turnings are beginning to come on the market in this territory. No. 1 busheling now is selling at $31. The government price is $32. Speculation has been entirely eliminated by the fixing of prices. Most contracts are being made with the proviso that any new government price at delivery will obtain.

Uncertainty Over Commissions

Cleveland, March 5,—Uncertainty over "commission or no commission" dominates the scrap iron and steel market in this district. Many dealers have come to the conclusion that the haziness on this point of the new schedule of prices recently announced is purposeful, the intention being to

eliminate the 3½ per cent commission if the complaints do not prove overwhelming. It cannot be ascertained that any scrap has been sold minus the commission, while several deals with the commission are reported. One of the largest dealers in this territory is not doing any business pending an expected announcement. If none is forthcoming, dealers say they will be forced to accept the new schedule at its face value. No sale of cast scrap of cupola size at $35 is yet reported. The trade feels that foundries being practically the only users of cast, would have obtained as plentiful a supply at $30 as at $35. The $37.50 grade of low phos has aroused some discussion, too, it being felt that it is an in-between grade that can too readily be thrown $2.50 either way. All dealers' offers to consumers are being snapped up.

New Prices Satisfactory

Chicago, March 5.—Both buyers and sellers of iron and steel scrap appear well satisfied with the new price schedule recently announced. The market has been showing more stability and buying has been stimulated. Demand for foundry grades is decidedly heavier and cast scrap, which was difficult to dispose of recently, is in strong demand, with prices considerably higher. Lack of a decision on the matter of commissions on scrap sales where the price is at the maximum is preventing some trading. Rumors are heard from time to time of some grades being traded in at prices above the announced maximum and shipments of scrap to eastern users are said to have been made on the basis of the Chicago quotation, the consumer paying the freight. Supply is fairly short in most lines and railroad offerings, which have been somewhat larger recently, have taken a slump at present. It is announced from headquarters of the scrap association that present prices are applicable only until April 1 and that contracts for delivery after that date must be subject to whatever price is announced for the period when delivery is made.

Market Remains Quiet

Cincinnati, March 4.—Mixed cast scrap is a little firmer, but the change was brought about by the new price regulations and not by any increased call for this kind of metal. Business is still very quiet. A prominent dealer states that no change of consequence may be expected until after all railroad embargoes are lifted. Even after such an order goes into effect, it will require considerable time to clean up shipments on contracts. Dealers are not adding to yard stocks.

Asks Shell Steel Tonnage

Government in Market for 183,000 Tons—Shortage in Semifinished Material, Especially Sheet Bars, Grows More Acute

Pittsburgh, March 5.—New shell steel inquiries aggregating 183,000 tons are understood to have been put before makers. Urgent inquiries in increasing number are being made for billets and sheet bars. There is an extreme shortage of this class of tonnage and makers are unable to satisfy the demand. Some of them not only are consuming all of their own output but are anxious to buy outside. A consumer in this district is seeking approximately 5000 tons of sheet bars. The government is taking large steel requirements and this factor is preventing domestic consumers from covering. Some makers who have heavy bookings for the government have speeded up their plants to the highest point in order to complete production on scheduled time. Demand for wire rods continues active. Some makers are not taking business, while others are accepting only limited lots. A middleman is seeking 300 tons. Two other inquiries involve 50 tons each. Platemakers in the east are searching this market for slabs, one inquiry involving 4000 tons. Jobbers also are after slabs, and together with independent sheet and tin plate mills are trying to obtain sheet bars. A large lot of ingots is being inquired for.

Limited Strip Sales Made

Pittsburgh, March 5.—Small tonnages of cold-rolled strip steel are being sold by makers in this district, largely for government work. Manufacturers of pleasure automobiles also are taking limited lots. Sales made call for first quarter delivery almost exclusively, producers being unwilling to commit themselves to any great extent after that period because prices are subject to revision April 1. The fixed price of 6.50c is being obtained on current sales.

Demand More Acute

Cleveland, March 5.—Demand in the open market for various forms of semifinished steel is intense as there is little material for sale. Sheet and tin plate mills continue to seek sheet bars actively, taking practically anything that the mills can offer them whether it be small tonnages or offheats. The mills have virtually nothing for sale. An inquiry for 1800 tons monthly of open-hearth blooms for an indefinite period has been put out by a large consumer in northern Ohio and this probably will be satisfied soon as it is related to war work. Another northern Ohio finishing mill has been asking for a tonnage of rerolling billets for miscellaneous purposes.

Many Nails

Wanted by the Government—Wire Price Irregularity is Reported

Pittsburgh, March 5.—Operations of wire mills in this district continue to increase and are now estimated at about 65 per cent of capacity. Shortage of steel still hampers the output and compels makers to decline to quote on numerous inquiries. The government is seeking 12,000 kegs of nails. Two inquiries, one for 300 tons and the other for 400 tons, have been put out by domestic consumers for barbed wire. Fair demand is also being made for plain wire. Some of the business being taken calls for delivery at the convenience of mills. Makers are hoping to increase production through the free use of discard steel, which would have to undergo a process of annealing before being suitable for the wire trade. Tests are said to have shown that large nails can be made with particularly good results from discard steel. It is reported that wire nails are being offered direct by one producer to small consumers at $3.80 per 100 pounds, Pittsburgh. The government price for jobbers is $3.50.

Mills Lack Stocks

New York, March 5.—Various government departments are allotting wire and nail orders constantly but these represent only a small total. There is, however, an active demand for wire products from miscellaneous sources based on direct and indirect government requirements. General domestic demand also is more urgent so that in conjunction with reduced manufacturing operations, producers are prevented from accumulating stocks.

Will Hear Officer

The March meeting and dinner of the New England Foundrymen's association will be held at the Exchange club, Boston, Wednesday, March 13, at 6 o'clock. The speaker will be Capt. Leslie Vickers, whose subject will be "Out of the Trenches".

Bar Buying Much Better

Consumers in All Districts Showing More Interest in Purchases—Implement Orders Liberal—Reinforcing Lots Are Sought

Chicago, March 5.—Increased inclination to buy steel and iron bars is noted in the west and inquiry is increasing steadily. In the case of soft steel bars it is practically impossible to place new business as demands by the government for all forms of finished steel are sufficient to absorb most production. Agricultural implement makers have been able to cover their requirements without definite promises of delivery but with assurances of being taken care of as well as possible. Bar iron demand is not heavy but current business is steady and most tonnages are wanted for quick delivery. Bar iron is being utilized in place of sofe steel for many purposes. A better demand for rerolling bars is current, implement makers using this form of steel instead of soft steel bars and reinforced concrete builders showing added interest. While most of this business is for prompt delivery, some inclination is noted toward making contracts for future delivery.

More Demand Appearing

Cleveland, March 5.—The approach of spring appears to be the cause for the bringing out of a considerably increased demand for merchant steel bars from general consumers in this territory. Implement manufacturers especially have been sending in liberal specifications which with some makers are the best in several years. Jobbers also have been placing some attractive orders for shafting, one of which was in excess of 500 tons. Reinforcing bar demand is light due to the limited amount of building construction. Some makers in this district have accumulated unusually large stocks of this product. An inquiry for 1000 tons of reinforcing bars for construction work in Kansas City is current.

Expect Heavy Implement Buying

Pittsburgh, March 5.—Indications are developing that the implement trade is about to come into the market for tonnages of steel bars and it is believed that buying will be well under way during the fore part of April, and will involve the largest tonnages these consumers ever have taken. A large portion of it will be required for the construction of farm tractors. Operations of mills have increased considerably and while makers are deferred on shipments and well committed for the first half it is probable they will be able to take good sized tonnages after the output gets nearer to its normal status. Makers of bar iron are operating heavily on government contracts and are able to take only limited tonnages from domestic consumers.

Wanted for Chemical Uses

Philadelphia, March 4.—Sales of steel bars continue limited to occasional small tonnages. Included in business of the past week was one lot of large diameter rounds up to 6 inches. Although bars continue difficult to get, the outlook is that offerings shortly will be more plentiful. Demand of late has shown a falling off. Iron bars also are quiet. The quotation most frequently heard now is 3.50c, Pittsburgh, compared with the maximum of 3.50c, mill, or Pittsburgh. An unusual inquiry calls for several thousand tons of special analysis bar for chemical use. Demand for tool steel is quiet and a current inquiry for 30 tons of high-speed steel and 30 tons of high-carbon steel is exceptional.

Want Reinforcing Bars

Buffalo, March 5.—Inquiry for reinforcing bars has been fair. There has been a demand for several 1000-ton lots for export, and more or less government purchasing. There has been a slightly increased activity in commercial demands. An inquiry approximating several thousand tons is before the market from northwest Canada. A local sale of 1000 tons of soft steel bars in the past week is noted.

Need Tonnage For Buildings

New York, March 5.—An inquiry for 8100 tons of concrete bars for army and navy buildings at Washington and for naval stores depots in South Brooklyn has been put out by the Turner Construction Co. The bars probably will be allotted through government channels.

Seeks Shafting Tonnage

Pittsburgh, March 5.—An Ohio consumer is inquiring for 7000 tons of cold-rolled shafting to be worked up into war material. Most of the tonnage being sold is for government purposes. The implement trade is closing for limited amounts. While it is the general policy of makers not to sell beyond the first quarter, some business is being taken from implement interests for second quarter, the price being subject to revision by the government on April 1. Tonnages to be delivered previous to that period are being sold at the fixed level of 17 off to list, Pittsburgh, in carloads.

Hoop Demand Good

Pittsburgh, March 5.—Makers of hoop steel are booking tonnages for miscellaneous manufacturing lines rather freely at the fixed price of 3.50c, Pittsburgh. Better demand exists for flat steel, which is being sold at maximum levels. A small portion of the latter business is for second quarter shipment. Makers are hesitant about selling for this delivery because of the uncertainty as to prices after March 31. Only limited lots of bands are being sold. The price of 2.90c, Pittsburgh, is not sufficiently attractive to cause manufacturers to actively solicit business.

Pipe Market

Shows Activity in Wrought Goods But Dullness in Cast Product

Pittsburgh, March 5.—The market for iron and steel lap weld pipe is active. Mills are having no trouble in making sales, and some are so heavily committed that they are out of the market. A leading steel pipemaker is filled up for one year on lap weld tonnages and for 18 to 20 weeks on butt weld sizes. A prominent maker of iron pipe is about two months behind on deliveries of lap weld orders but can make fairly prompt deliveries of butt weld tonnages from the relatively small stock on hand. The chief difficulty is the transportation situation, which has made it impossible to get a steady and sufficient supply of pig iron and skelp. Mills are operating as heavily as is possible, the only restriction being the supply of raw material.

Eastern Market Looking Up

New York, March 5.—The tone of the cast iron pipe market in the east continues to firm up, and prices are steadier than in weeks. This has been brought about by the further good demand from private sources in conjunction with expectations of increased government awards. Included in recent purchases are 300 tons by the J. G. White Engineering Corp. for government work at Sheffield, Ala. It is estimated that 3000 tons eventually will be needed for the Sheffield plant. Considerable export demand continues, but due to diffi-

culty in obtaining ships, little of this business has reached consummation Nothing new has developed in the way of public work.

Tonnage Small in West

Chicago, March 5.—Cities continue to buy lightly for their cast iron pipe requirements to meet 1918 extensions. Bids will be opened at Minneapolis March 7 on 450 tons of 42 and 48-inch pipe. The United States Cast Iron Pipe & Foundry Co. has been awarded 485 tons for Rockford, Ill., the American Cast Iron Pipe Co. 1392 tons for Minneapolis and the Hammond-Bird Iron Co. 438 tons for St. Paul.

Operate Under Difficulties

Birmingham, Ala., March 5.—Cast iron pipe plants in this territory are operating under difficulties. The effect of the quiet pipe market is being felt and on top of it a strike on the part of metal trades workmen who are seeking an 8-hour day with the same pay they have been getting for 10 and 11 hours. On of the larger cast iron pipe plants still is down and a foundry and machine shop at Bessemer also is out of commission. Some contracts being held up are for the government and this may bring federal intervention.

Spring Betterment Lacking

Boston, March 4.—Local jobbers continue to do a rather good business with those companies engaged on war orders, but still find the demand for structural material exceedingly slow. In fact, the latter division is quieter even than it has been and the trade as a whole is not looking for the improvement which usually develops about this time of the year when mild and open weather is conducive to building operations. Not only are building materials, outside of iron and steel, so high as to discourage new construction, but labor is short and high and the banks are not inclined to put out money for building purposes, unless the proposed structure is necessary for government work. Some improvement is reported in the deliveries of stock from the mills, but the jobbers are still a long ways from being well supplied with those lines needed by war plants.

A complete catalog, showing the resistance materials, nickel alloys and monel metal has been prepared by the Electrical Alloy Co., Morristown, N. J. It gives much data of interest to electrical engineers and electrical device manufacturers. Copies will be sent on application.

Great Car Tonnage Needed

Expected Government Awards of 150,000 Cars Estimated Will Require 1,500,000 Tons, Mostly Plates—Ship Steel Closed

Pittsburgh, March 5.—A huge tonnage of plates and in a lesser degree of shapes and bars is involved in the tremendous program of railroad equipment buying by the government, the necessary legislation for which now is reaching a final stage. Not less than 1,500,000 tons of steel will be called for if 150,000 box, hopper and gondola cars are purchased as now is indicated. The box cars will call for 7 tons of steel each and the hoppers and gondolas for 17 tons each. In addition if 2500 locomotives are bought, this means probably 75,000 tons more of plates. Makers of plates in this district are well sold up and except for comparatively small tonnages they are offering nothing in the open market.

Production Increases Slightly

Philadelphia, March 4.—Plate mill operations have shown a slight improvement during the past week. Present output in eastern Pennsylvania appears to be at the rate of about 55 per cent of capacity. The chief obstacle to a more pronounced betterment is continued scarcity of gas coal. In the face of the reduced operations and the continued huge requirements, eastern Pennsylvana mills are unable to take on any of the orders which consumers all over the country are clamorous in trying to place. Mills figure that they now have enough orders on their books to keep them occupied for 10 months ahead. Practically all of this is urgent government business.

Ship Steel Placed

Cleveland, March 5.—Government ship work on the lakes continues to direct some sizable tonnages to the mills. A new lot to be placed with Pittsburgh makers calls for 10,000 tons of shapes and plates for eight vessels for the Emergency Fleet corporation placed with the Toledo Shipbuilding Co. Another order distributed this week involves 2500 to 3000 tons of plates, shapes and bars for gun mounts on 70 government ships building on the lakes. Considerable tonnage also remains pending for the rebuilding and reinforcing of those vessels which are to be cut in two for passage of the Welland canal. It is understood that the American Shipbuilding Co. has the assurance of additional government contracts which will engage its capacity to the end of 1919. Local mills have been completing some shipments of light plates for airplane drop bombs.

Ship Demand Strong

Chicago, March 5.—Demand for steel plates continues the strongest feature of the finished steel market and shipbuilders, buying through the government, are taking by far the largest part of the tonnage. The government continues to place large tonnages, both for fabrication in bridge shops and for use at shipyards. These allotments range from small lots to 20,000 tons or more. Aside from government business mills are unable to take on much further tonnage of plates.

Now Selling Ore

Contracts for 1918 Lake Superior Ore Are Being Signed

Cleveland, March 5.—Lake Superior iron ore for 1918 delivery is now being sold. Operators have begun to send out contracts to consumers. The prices called for are those in the 1917 schedule. These quotations are: Old range bessemer, $5.95; Mesabi bessemer, $5.70; old range nonbessemer, $5.20; Mesabi nonbessemer, $5.05.

The contracts now being signed are largely by consumers who previously had reserved ore for their 1918 needs. The ore market has been disturbed for weeks by the request of the government that the prices approved on Jan. 1 be not used in contracting beyond March 31 of this year. The ore trade has operated on a 12-month basis so that the actual selling movement for this year has been delayed until means were devised of meeting this ruling. This is now being done by the insertion of a special clause in the new contracts providing for a readjustment of the prices to meet the future action of any authorized federal price-fixing agency.

Considerable ore remains to be sold in the open market, despite the heavy reservations which many consumers have made. Ore sellers expect that before March 31 some definite interpretation will be obtained from the government regarding the setting of a fixed price for the entire season.

The Groton Iron Works, Groton, Conn., will start work immediately on six steel cargo-carrying ocean liners.

Place French Depot Steel

Ordinance Buildings for Expeditionary Force Call for Large Structural Tonnage—Powder Store Houses Awarded

New York, March 5.—Tremendous tonnages of steel are involved in the construction of the ordnance base depot in France. Among other awards the Fort Pitt Bridge Works was alloted 15,000 tons, and will erect 20 buildings. The American Bridge Co. also is reported to have received a large tonnage. The depot will include 20 storehouses, 12 shop buildings and 100 smaller shops. Large tonnages for government powder storehouses also have been placed. The aggregate of those jobs of the character placed are still pending is placed at 25,000 tons. Demand in the New York structural market remains dull, although considerable business bearing principally on government work is in prospect. This not only involves the huge tonnage required for airplane shelters, but a number of miscellaneous tonnages for plant additions. As soon as the railroad situation becomes more improved and manufacturers have some definite assurance that they not only will be able to make shipments, but will have supplies of fuel sufficient for their needs, a much better demand for structural steel will arise. Export demand also is of small volume. At present, the majority of the fabricators have considerable work on hand. This, however, is not due so much to new demand, as to delays occasioned by the difficulty in getting material and in the making of shipments of steel already fabricated.

Place Navy Yard Tonnage

Philadelphia, March 4.—As far as ordinary structural lettings are concerned the market in this district continues devoid of developments. The only activities involve government work and there is nothing of importance in this direction. A fair sized tonnage for an airplane assembling plant at the League Island navy yard will be supplied by the American Bridge Co. The contract for a storage building at League Island of reinforced concrete has been let to Cramp & Co. Sales of plain structural shapes involve only a few small tonnages here and there.

Western Demand Light

Chicago, March 5.—Buying of structural shapes for building purposes is even lighter than it has been during the past few weeks. The spring building season holds no promise of increasing business and the trade looks forward to almost nothing outside of industrial and war business. The latter, however, promises to engage most fabricating shops and lack of general buying probably will not be so much of a factor. Recent tonnages placed in the west are for small lots and entirely for industrial purposes.

Car Shortage Holds Up Work

Pittsburgh, March 5.—Shortage of cars has made it impossible for some fabricating shops to obtain steel and as a result they have had to delay work on important government contracts. Operations are devoted almost exclusively to government requirements.

CONTRACTS AWARDED

Conveyor supports, etc., for primary and secondary crushing plant, 160 tons, for Utah Copper Co., Arthur, Utah.

Steffens plant for the Utah-Idaho Sugar Co., Toppenish, Wash., 150 tons, to Minneapolis Steel & Machinery Co.

Headframe for the Colby Iron Mining Co., Bessemer, Mich., 100 tons to Worden-Allen Co.

Tractor assembly plant for the Chandler Motor Car Co., Cleveland, 320 tons, to the Russell Wheel & Foundry Co., Detroit. Ernest McGeorge, Leader-News building, Cleveland, engineer.

Additions to the American Multigraph Co., Cleveland, 400 tons, to the King Bridge Co.

Twenty buildings for the ordnance base depot in France, 15,000 tons, to the Fort Pitt Bridge Works. American Bridge Co., also receives large tonnage.

Extension to the plant of the Standard Car Construction Co., Sharon, Pa., 235 tons, to McClintic-Marshall Construction Co.

CONTRACTS PENDING

Additions to the plant of the D. Connelly Boiler Co., Cleveland, 200 tons, bids taken by the company.

Ferro Prices

Unchanged Despite Low Supply of Spot Metal and Foreign Ore

New York, March 5.—Current transactions in ferroalloys are small. Sales of ferromanganese during the past week totaled only a few hundred tons. The market continues firm at $250, delivered. The fact that prices have not been advanced recently has caused surprise in some quarters. The supply of spot ferromanganese is very low and the foreign ore situation remains unchanged. The embargo in Brazil against shipments of manganese ore to the Brazilian seaboard still is in effect. There are practically no offerings of foreign ore. There is considerable apprehension whether production, after present foreign ore reserves are used up, can be maintained anywhere near capacity. Producers in some cases are complaining that present prices on ore threaten to reduce their profits to the vanishing point.

To Supply Manganese

New York, March 4.—The Phillipsburg, Mining Co. Phillipsburg, Mont., has closed a contract with a leading eastern maker of ferromanganese to supply to the latter all of its output of manganese concentrates and about half of its production of natural ore. It now is turning out concentrates at the rate of about 225 tons per day and shortly will increase this to 300 tons. These concentrates average 45 per cent manganese, 10 per cent silicon, 1½ per cent iron and some alumina.

Ferrosilicon Market Active

Pittsburgh, March 5.—Fairly active demand exists for small tonnages of 50 per cent ferrosilicon. Some makers are quoting both prompt and second half tonnages at $175, delivered, although a quotation as high as $190, delivered, is also being made for spot shipment. Small lots of ferromanganese have been sold during the past week for shipment in three, six and nine months, the price being $250, delivered, which is also named for prompt shipment. Spiegeleisen is quoted at $60 to $65, furnace.

Higher Rates

On Tin Plate to Pacific Coast Cause Speeded Up Shipments

Pittsburgh, March 5.—Freight rates on tin place to the Pacific coast of the United States will advance from 75c to $1 and to British Columbia from 75c to $1.25 a box on March 15. Efforts are being made to have large shipments made to consumers to those points before the higher rates become effective. Shipments during the past week have not shown any appreciable improvement, but the food administration is understood to be still taking steps to give further relief in the way of supplying more cars. Railroads were instructed recently to give priority shipment to tin plate for shipments to the west, but the shortage of available cars has made it impossible for them to furnish sufficient rolling stock. Operations of all mills are reported to remain at about 60 per cent of capacity.

The T. W. Price Engineering Co., New York City, has taken a contract from McCord & Co., Chicago, for handling the plant additions made necessary by the installation of a new 10-ton electric furnace.

Pig Iron Output Shows Small Gain

Production in February Increases Slightly Over January But is Well Below Previous Months—25 Furnaces Relighted as Operating Conditions Improve—March Production Should Show Increase

BLAST furnaces at the opening of March were operating at a higher rate than at any previous time in weeks. A large number of stacks were relighted during the closing weeks of February. This fact coupled with the removal of part of the restrictive factors which slowed down production seriously in January, forecasts somewhat heavier pig iron production this month.

MONTHLY PRODUCTION

	1918	1917	1916
January ...	2,403,227	3,159,839	3,171,878
February ..	2,316,545	2,649,935	3,078,548
Total 2 mos.	4,719,772	5,809,774	6,250,426
March	.....	3,255,813	3,327,630
April	.....	3,328,061	3,225,496
May	.....	3,413,677	3,364,584
June	.....	3,260,234	3,213,818
Total 1st half.	.....	19,067,559	19,381,954
July	.....	3,337,442	3,221,127
August	.....	3,238,970	3,197,838
September .	.....	3,140,742	3,208,041
October	.....	3,296,286	3,508,180
November ..	.....	3,198,597	3,317,805
December ..	.....	2,885,380	3,184,178
Total 2d half	.....	19,097,417	19,637,169
Grand total	4,719,772	38,164,976	39,019,123

This improvement is reflected in the output of coke and anthracite pig iron during February. The total production last month was 2,316,545 tons, against 2,403,227 tons in January, a loss of 86,682 tons. This loss, however, is only apparent, as the average daily output in February was 5211 tons greater than during January. The blast furnaces averaged last month a daily production of 82,734 tons, against 77,523 tons in January.

The serious drop in production during December and January, together with the slight improvement last month, are reflected clearly in the records made by Pennsylvania, Ohio, New York, Indiana and Illinois stacks. These furnaces in December had an average daily output of 75,600 tons, in January 61,200 tons, and in February 65,500 tons. Despite the short month, the production in Indiana and Illinois was greater in February than in January, although far below the December record.

Many of the furnaces which were forced to bank or blow out on account of fuel shortage have again been placed on the active list. On Feb. 28, 319 stacks were in blast, compared with only 294 on the last day of January, a net gain of 25. The February total is only two less than the Dec. 31 figure of 321. The gain in active furnaces in February was made almost entirely by steelmaking stacks. Twenty-five nonmerchant furnaces were blown in and only four blown out, a net gain of 21, while 12 merchant stacks were relighted and eight blown out, a net gain of four.

The production of steelmaking or nonmerchant stacks during February was 1,640,403 tons, a loss of 30,262 tons compared with the January figure of 1,670,665 tons. A much greater loss was shown by the merchant stacks. Merchant iron production amounted to 647,337 tons, compared with 701,727 tons in January, a loss of 54,390 tons. A comparison of the daily averages, however, shows a gain in both the merchant and nonmerchant production. The steelmaking stacks produced 58,586 tons daily in February, compared with 53,893 tons in January, a gain of 4693 tons, and the merchant furnaces gained 483 tons, the February daily average being 23,119 tons, and the Janury, 22,636 tons.

In February, 18,156 tons of ferro were produced, compared with 22,824 tons in January, a loss of 4668 tons. Spiegel production showed a gain of 2638 tons. The tonnage in February was 10,649, against 8011 tons in the previous month.

AVERAGE DAILY PRODUCTION

	1918	1917	1916	1915	1914
Jan.	77,523	101,930	102,319	51,323	60,624
Feb.	82,734	94,641	106,157	59,521	67,450
Mar.	.....	105,026	107,343	66,009	75,534
Apr.	.....	110,936	107,517	70,484	75,383
May	.....	110,119	108,535	72,747	67,646
June	.....	108,675	107,127	78,998	63,486
July	.....	107,659	103,907	82,687	63,075
Aug.	.....	104,483	103,156	89,510	64,403
Sept.	.....	104,691	106,935	94,478	62,757
Oct.	.....	106,332	113,167	100,656	57,007
Nov.	.....	106,620	110,593	101,174	50,042
Dec.	.....	93,077	102,715	103,278	48,236
Av'ge	79,996	104,562	106,610	81,022	62,934

FEBRUARY PIG IRON

States	No. of stacks.	No. in blast last day of month.		Total tonnage made.		—Totals—	
		Feb.	Jan.	Merchant.	Non-Merchant.	Feb.	Jan.
Pennsylvania	160	117	105	150,985	730,159	881,144	938,859
Ohio	79	64	53	123,346	382,095	505,441	542,648
Alabama	47	32	33	116,385	91,190	207,575	218,410
Virginia	21	14	14	40,914	.....	40,914	39,694
New York	27	19	19	65,400	87,784	153,184	169,357
New Jersey	6	4	5	15,033	.....	15,033	17,196
Illinois	24	20	17	38,656	119,188	157,844	130,217
Colorado	6	4	3				
Indiana	14	13	13	20,737	183,576	204,313	189,862
Maryland*	4	3	3				
Wisconsin	6	3	4				
Kentucky	7	4	4				
West Virginia	4	3	3	45,111	22,976	68,087	69,531
Tennessee	17	11	10				
Washington	1	1	1				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	3	3	3	30,770	23,435	54,205	56,618
Michigan	3	3	3				
Missouri	1	1	1				
Spiegel—All states...						10,649	8,011
Ferro—All states....						18,156	22,824
Total	435	319	294	647,337	1,640,403	2,316,545	2,403,227

Save Pig Iron

Says Replogle, by the Curtailment of Building Construction

Washington, March 5.—Laying stress on the acute shortage of pig iron which was analyzed and emphasized by THE IRON TRADE REVIEW in its last week's issue, J. Leonard Replogle, director of steel supply, is advocating curtailment of building construction as a means of conserving blast furnace metal for the more essential production of plates and other war steel. His position in the matter was made clear in a letter to Paul M. Warburg, chairman of the capital issues committee of the federal reserve board, indorsing the plan to discourage new construction as a means of conserving the country's financial resources.

Mr. Replogle's letter to Mr. Warburg in part said:

"As regards the steel situation, I would state that the supply of structural steel is ample for all purposes, but owing to the curtailment of operations of blast furnaces and steel mills, due to shortage of fuel and inadequate transportation, the pig iron situation is becoming acute."

Huge Car Orders Are Near

Government Preparing to Buy Probably 125,000 to 150,000 Cars and 2500 Locomotives—Large Rail Purchases Also in Sight

Pittsburgh, March 5.—Heavy buying of railroad cars and locomotives is about to begin now that the administration bill appropriating $500,000,000 to buy equipment is in conference and is soon to be reported back to congress. Indications are that the cars and locomotives will be bought direct by the government, and that while the bill provides for the purchase of a maximum of 250,000 cars and 4000 locomotives, the first lot to be closed is expected to be between 125,000 and 150,000 box, gondola and hopper cars and 2500 locomotives. The cars will be standardized and designs, it is reported, will be ready by the middle of next week and the order will be placed within a few days.

It is the impression that the box cars will be of 80,000 pounds capacity, and that the gondolas and hoppers of 100,000 pounds. It is not known how the cars will be distributed as to types. In view of the situation regarding material and labor, it has been roughly estimated that it will require until the end of 1919 to turn out this equipment. Car shops are prepared to begin building at once. Some of them are cleaning up all their orders and will have them out of the way early in April.

Jobbers are showing increased interest in small spikes and limited quantities are being sold for first quarter. Some producers are out of the market, not finding attractive the price of $3.90 per 100 pounds base, Pittsburgh, in 200-keg lots. For shipments under this quantity the price is $4.90. Inquiries involve sizes from 4½ x ½ inches down to 2½ x 3/8 inches chiefly. The market for standard railroad spikes is quiet. The Baltimore & Ohio railroad has taken approximately 5600 kegs from a Pittsburgh manufacturer for prompt delivery. Dullness also prevails in the market for standard rails. Light sections are fairly active.

Seek Rail Requirements

New York, March 5.—In order to ascertain the steel rail requirements of the railroads in 1918, Director General McAdoo has issued questionnaires to all railroads under government control. It is understood the total tonnage involved in these requirements will be purchased by the government and then allotted to the various roads.

The railroads are advised to forward their questionnaires, when filled out, to George B. McGinty, secretary of the interstate commerce commission. In the questionnaire the railroads are asked to state the number of gross tons in track during 1917; also to estimate separately, for maintenance and construction, the number of gross tons required in 1918, and to state the minimum number of gross tons absolutely required to maintain tracks in a safe condition during the year. They further are asked to give the tonnage contracted for delivery during 1918, including the amount due on previous contracts or carried over from previous years and the tonnage on hand Jan. 1, 1918.

Due to developments at Washington, the purchase of rails during the past month has been comparatively light. It is estimated in some quarters that not more than 20,000 tons were booked during February. In the car and locomotive market, buying also has been light. Aside from 3500 cars of miscellaneous types purchased by the government for the expeditionary forces in France, few large single orders were awarded. Total car contracts awarded during February for domestic use are estimated at about 1800.

Inquiries for tank cars are more numerous. These principally are from oil companies and total approximately 650 cars of 8000 to 10,000 gallons capacity. During the past week about 30 tank cars were placed chiefly with the Pennsylvania Tank Car Co.

Await Government Car Order

Chicago, March 5.—Greatest interest in the railroad car market at present is centered in the expected buying by the government of 150,000 standard freight cars. It is understood that car builders have been asked to consider such an order, and that its distribution waits definite choice of the standard type. This probably will present some difficulties and the cars may not be placed with builders for some time. Aside from this, nothing is being considered as all railroads are holding off to allow the government to take the initiative. Only odd lots of standard steel rails are being booked and these do not amount to an important tonnage. No inquiry is being received for delivery during 1919, and it is apparent that the railroads expect the government to place orders for that year. In fact, one inquiry recently put out has been withdrawn with the statement that the government probably will do the buying.

Sheet Shortage

Feared Because of Reduced Output—60 Per Cent Operations

Youngstown, O., March 6.—All sheet mills in this territory are booked to capacity for some weeks and current inquiry for all grades is heavy. This has led some makers to believe that there will be a sheet shortage in the near future. Blast furnaces and open hearths in the valley have not operated at capacity for some time and as a result the sheet bar and sheet mills are beginning to feel the pinch. Nearly all the sheet mills here are in arrears with their deliveries. Consumers who are inquiring for second quarter are asking the mills if they will make an adjustment on prices providing the government alters the present ones. One maker is replying to these inquiries as follows: If the prices are lowered and the sheets have been previously rolled the buyer will pay the present prices; but if the sheets are not rolled until after the next price announcement then an adjustment will be made. Makers are not promising any open-hearth sheets for the next quarter on account of the present shortage of open-hearth bars which threatens to grow more acute. Buyers are being informed of this condition and of the advisability of obtaining this grade of sheets wherever possible. Most of the valley sheetmakers state, however, they will be in a position to supply their customers with bessemer material.

Specify Heavily for Sheets

Pittsburgh, March 5.—Heavy specification for all grades of sheets are coming to mills and some new business has been taken. Tonnages of galvanized sheets for second quarter shipment have been allotted by the leading interest to sales agents, jobbers having inquired freely for this delivery. The government continues to take heavy requirements, and will need an unusually big tonnage of No. 22 corrugated sheets for hangars in France. Operations of all mills are roughly estimated at between 50 and 60 per cent of capacity. Mills are suffering from a shortage of sheet bars but are hampered mostly by the transportation situation, which improves slowly under the bettered conditions.

Costs May Force Higher Price Plea

Steel Makers at New York Conference Review Conditions of Industry Preliminary to Conferring with War Board on Price Settlement April 1—Some Makers in Difficulty Because of Costly Raw Materials

OFFICIALS of iron and steel companies comprising nearly 100 per cent of the country's production, held a meeting at the Waldorf-Astoria hotel, New York, March 1, to formulate, for presentation to the war industries board, important recommendations for changes in present prices on iron and steel products. This meeting succeeded two previously held, which differed from it only in that the first two were confined to members of the general committee on steel and steel products of the American Iron and Steel institute.

The meeting of March 1 occupied the entire day and was devoted to a discussion of the costs of manufacture at iron and steel plants in order that this data may be submitted to the war industries board at Washington during the next week or two, to serve as a basis for warrantable price action by the government. Although no such information was given out following the conclusion of the meeting, it is understood the greatly increased cost of manufacturing iron and steel during the past few months, was shown indicating the necessity for higher prices, particularly in the case of the Class 3 mills, which buy their pig iron or semifinished steel in the market. Some of these mills have been sustaining losses as a result of the government prices now prevailing.

After the meeting, Chairman E. H. Gary of the general committee on iron and steel of the institute, gave out the following statement:

The general committee on steel and steel products of the American Iron and Steel institute expects to be invited in the near future to appear before the war industries board at Washington to discuss prices for the various iron and steel products, commencing March 31, when the term for the present prices, as approved by the President, expires.

The meeting today of representatives of the various lines was held for the purpose of examining the cost sheets of manufacturers and for the discussion of the relative or differential prices heretofore in force in order intelligently to present to the war industries board the facts necessary to a determination of future prices.

After the presentation of facts and figure, it was finally decided to place the claims of the manufacturers in the hands of the general committee for submission to the war industries board in such a manner as the committee may determine.

Those present by invitation in addition to the members of the committee included Frank H. Gordon, W. Vernon Phillips, Wm. B. Dickson, A. A. Fowler, Leonard Peckitt, J. G. Butler Jr., Jay I. Andrews, Frank Baackes, Wm. H. Donner, James B. Bonner, Waddill Catchings, and others.

Official Action Uncertain

WASHINGTON, March 5.—With the time for steel price adjustments less than a month away, the industry is pausing in its efforts hampered by fuel shortages and transportation difficulties to bring production up to normal, to turn an anxious eye toward Washington. But has yet no enlightenment is to be had. No one here really appears to know just what form the price adjustment steps will take. Representatives of the industry undoubtedly soon will be called into conference with the war industries board, as was the case in September and December.

It is evident some readjustment of prices will be made. Whether this will be upward or downward or some of both is too early yet for speculation, but the emergencies of the winter just past undoubtedly will be reflected in cost reports. The impression given in New York that lower prices after April 1 will be opposed is felt here also. It is even suggested that the present prices will be urged to be revised upward.

No intimation has yet been given what attitude the government will take on the clause forced on steelmakers in the last price ratification. That clause prevents manufacturers contracting for their output at present prices unless the contracts provide for acceptance of the price no higher than the maximum quotations to be promulgated effective April 1. If the prices are revised upward, it is believed the clause will be continued. If they are downward, there is a possibility of the restriction being removed.

It is believed here it is likely that the prices to be fixed April 1 will be continued for a period longer than the three months' limit considered. Another interesting point arising in connection with the price adjustment program is, what will be the war industries board's attitude toward the long list of extras and differentials promulgated by the trade in accord with the President's announcements?

Baruch Seeks Efficiency

WASHINGTON, March 6, 1917.—In official circles it is believed that the naming of Bernard M. Baruch, of New York, as chairman of the war industries board to succeed Daniel Willard, resigned, will mean greater efficiency in that body and the clarifying of the muddled situation arising from the lack of authority. Mr. Baruch, who has been head of the raw materials division, often has declared himself in favor of further centralization and in reorganizing the board. His main effort, it is expected, will be expended along that line. President Wilson in appointing him to the chairmanship, admonished him to let alone what is being successfully done and assist all present normal processes.

Suggestions made to him by the President as to his duties may be summarized as follows: Creation of new facilities and disclosing additional sources of supply; conversion of existing facilities to new uses; studious conservation of resources and facilities; advising various purchasing agencies as to prices to be paid; determination of priority of production and delivery and of the proportions of any given article to be made immediately accessible to purchasing agencies when the supply of that article is insufficient and the making of purchases for the allies.

Quantity Production

With Radical Price Regulation Limit Republic Earnings

The Republic Iron & Steel Co.'s report for the year 1917 shows net earnings of $28,329,718, compared with $16,544,635 in 1916. Provision for excess profits taxes and other contingencies amounted to $9,878,657 in 1917. After this provision and all other charges and deductions, the balance available for dividends was $15,857,196, as compared with $14,789,162 in 1916. The summary of profits applicable to dividends by quarters shows graphically how steel company earnings are dwindling as the result of war conditions. This summary for the past two years follows:

1917:	Profits
Fourth quarter	$2,811,858
Third quarter	1,568,004
Second quarter	7,130,406
First quarter	4,346,927
1916:	
Fourth quarter	5,139,441
Third quarter	3,628,634
Second quarter	3,903,676
First quarter	2,139,441

The income accounts for the years 1917 and 1916 compare as follows:

*Net earnings	$28,329,718	$16,544,635
Other income	439,302	348,576
	$28,769,021	$16,893,212
Less:		
Deprec. and renew...	$1,999,760	$600,090
Exhaust. of min.....	274,072	245,221
Extraord. deprec. ...	.....	400,000
Excess profits tax.....	9,878,657	.....
Total deduct	$12,152,489	$1,245,312
Net profits	16,616,531	15,647,899
Deduct:		
Bond int.	759,334	858,736
Pref. divs.	1,750,000	4,500,000
Com. divs.	1,631,460	407,865
Total deduct	$4,401,794	$5,766,601
Surplus for year.....	12,475,736	9,881,297
Surp. Dec. 31, 1916..	18,236,251	8,354,953
Surp. Dec. 31, 1917	$30,711,988	$18,236,251

*From operations, after deducting charges for maintenance and repairs amounting to $3,559,157 in 1917 and $2,138,373 in 1916, and after deducting special compensation under merit system plan.

The gross volume of business for 1917 was $78,325,461, comparing with $52,844,017 in 1916 and $29,916,228 in 1915. The value of inventories Dec. 31, 1917, was $13,475,652 at the close of 1917, compared with $8,814,358 at the close of 1916 and $7,634,728 at the close of 1915. The company added $7,277,464 to new property account in 1917, the total new construction to Dec. 31, 1917, being $33,780,931. Following is a comparison of the company's production of various materials during the years 1917 and 1916:

	1917	1916
Pig iron	1,062,657	1,117,597
Bessemer steel	675,182	718,377
Open hearth steel.....	486,601	541,594
Mill products	1,109,829	1,216,716
Beehive coke	676,390	669,239
By-product coke	653,419	616,401

The average number of men employed in 1917 at all works was 14,510, compared with 13,056 in 1916 and 11,105 in 1915.

The balance of unfilled orders Dec. 31, 1917, in steel was 318,324 tons, against 617,950 tons in 1916 and 591,270 tons in 1915, and in pig iron 100,619 tons against 183,026 tons in 1916 and 138,406 tons in 1915.

Handling All Alloys

The American Iron and Steel institute which recently was asked by the government to act as consignee for all importations of tin, chrome, cobalt, manganese, molybdenum, scheelite, spiegeleisen, titanium, tungsten, vanadium and wolframite, whether in the form of ore or of ferroalloy or chemical extracted therefrom, has undertaken this work for the government. It has enlarged its staff and its working space at its headquarters at 61 Broadway, New York. The institute has appointed the following to act as attorneys for it in customs matters connected with these importations: At New York, James T. McCleary, Howard H. Cook, William G. Gray; at Philadelphia, H. W. Summers, E. K. Bauer, J. F. Harder; at Baltimore, S. H. Bland, G. F. Medinger, J. D. Boan; at New Orleans, S. W. Wheelock, James L. Hyde, J. P. Pannill; at Eagle Pass, Tex., F. L. Jordan; at El Paso, Tex., John A. Wright; at Laredo, Tex., Ellis C. Williams; at Nogales, Ariz., William T. Haley; at San Francisco, A. T. DeForest, W. A. Ross, L. M. Korndorff, H. F. Wilson; at Seattle, Albert E. Knoff, Edward Bray, Karl S. Harbaugh.

The Non-Ferrous Metals

Copper **Lead** **Spelter** **Tin**

New York, March 5.—Consumers of tin are paying higher and higher prices for such small lots of spot metal as they can pick up. In the past week several sales of such small lots have been reported at 98c to 98.50c. Tin plate manufacturers are reported to be evincing more interest in their tin requirements, while makers of bearing, solder and babbitt metal continue in the market. No more Straits tin is available for March shipment from Singapore. The price for April shipment from Singapore is about 74.50c, c. i. f. New York; for May 73.25c; for June 72.75c. Various consumers are showing increased interest in Banca, due to difficulty in getting Straits. However, the output of Banca tin is normally not much more than 1000 to 1200 tons a month, or about one-fourth the normal output of Straits. Banca tin now afloat is quoted 76c; March shipment sold today at 72.50c; April shipment yesterday was quoted 72½c. Chinese 99 per cent tin, shipped in February from Honkong, is quoted 73.50c; March 69.50c; April 69c. It takes about three months for shipments of Straits from Singapore, Banca from Batavia and Chinese from Honkong, to get to New York.

The average price of lead for February as quoted in the *Engineering and Mining Journal*, was 6.889c, St. Louis. This is the price which the government paid for its requirements for the month. The average daily price of the American Smelting & Refining Co. for the month was 6.877c, St. Louis. The price of the leading interest now is 7.17½c, St. Louis, and sales have been made in the outside market at this price. Outside sellers are quoting 7.20c to 7.30c, New York. The market is weak today, with little commercial demand.

The spelter market continues to drag, with production gradually being further curtailed. Business is being done by makers of grade A spelter, sheet zinc and zinc plates at the new prices fixed by the government, but in the past week there has been some further shading in the price of prime western, whose price has not been fixed. The market for prime western now may be quoted 7.65c to 7.75c, St. Louis, for prompt, March and April shipment.

The aluminum situation has been growing tighter, largely because of the traffic situation. Outside sellers had just raised their prices before the price was set, asking 40c to 41c, for No. 1 virgin ingot; 39c to 40c for No. 1 remelted, 98 to 99 per cent; and 32c to 34c for No. 12 alloy. The government has fixed a price of 32c f. o. b. plant on ingot metal 98 to 99 per cent.

Several sales of antimony have been made the past week at 13.37½c, duty paid, New York, by dealers to makers of antimonial lead for shrapnel purposes. Little inquiry is in the market and stocks remain large. Sellers who have been disposing of metal at this price, say they have lost money on the transaction, in addition to the carrying charges.

Reports of the various copper producing companies for February indicate that production was maintained about at the January rate, despite the traffic troubles. While only a small proportion of the output is available for the requirements of ordinary commercial consumers, such requirements have become very small and no complaints are heard on the score of inability to get copper. The market continues 23.50c for carloads and 24.67½c for less than carloads.

NEW PLANT OF CANTON SHEET STEEL CO.

By JOHN D. KNOX

Fig. 1—Canton Sheet Steel Co.'s New Plant, Showing the Open-hearth, Soaking Pit and Bar-Mill Buildings

MAXIMUM production is the goal toward which every iron and steel concern in America is striving. This goal has been commanding the attention of mill managers for many years but the sledding has never been so hard as during the past two or three years. Executives have met obstacles on every side, first the shortage of raw materials, next the inability to obtain semi-finished material, then the difficulties of transportation, and finally a host of minor problems always pressing for immediate solution. But in spite of many handicaps the mills have cogged away as fast as their raw material was delivered to them. This raw material was sometimes scanty even before the United States went to war. There were periods when the tonnage of ingots sent through the sheet bar mills was exceedingly small and this, of course, put a damper on the production of finishing mills which were not self-contained. This condition was analyzed by some of America's keen-eyed business men who predicted that before long the intermittent operation of the mills would be more noticeable.

The iron and steel industry at large was not inclined to consider their statements seriously. A few concerns, however, were impressed and inaugurated building programs which would make their plants self-contained. Open-hearth furnaces began to spring up, bar mills followed, and in a short time the hum of the motors under test was drowned by the roar of the bar mill rolls. As a result a generous stock of raw material in the form of sheet bars accumulated in the storage yards. The sheet mills became independent of the tardy outside mills and no longer had to contend with irregular operating and traffic conditions.

Among the first concerns to realize that centralized control is exceedingly advantageous in the operation of sheet mills was the Canton Sheet Steel Co., Canton, O., a $2,000,000 corporation. The directors of the company in 1917 authorized the construction of open-hearth furnaces, soaking pits and a sheet-bar mill to supplement the previously existing sheet mills. The company was organized in the early part of 1910. By Jan. 2, 1911, a plant had been completed with a capacity of approximately 40,000 tons annually. The works consisted of three 28 x 34, three 28 x 38 and one 28 x 42-inch black sheet mills; seven pair and seven heating furnaces; four 24-inch cold mills; one combination heating furnace; seven box annealing furnaces; four pickling machines; and, eight galvanizing pots. April 10, 1916, the company added a 30 x 46 and a 30 x 56-inch jobbing mill, two 28 x 42 sheet mills, two 28 x 38-inch sheet mills, one stand of 24-inch cold rolls and four roughing stands.

Plant Changes Hands

In the latter part of 1917 the Canton Sheet Steel Co. was sold to the Hydraulic Pressed Steel Co., Cleveland, the amount involved in the transaction being $4,000,000. By acquisition of the Canton plant the Hydraulic company secured for itself and its subsidiary, the Cleveland Welding & Mfg. Co., control of its own raw material. At the time of the sale, the Canton company had $1,000,000 of 7 per cent cumulative preferred stock outstanding; $563,000 common, all closely held. The company paid for a substantial part of the new work out of its surplus and the remainder out of funds derived from the sale of preferred stock.

Ground was broken for the steel plant in February, 1917. The first ingot was rolled Dec. 26, 1917. The new plant includes three 35-ton open-hearth furnaces, 11 gas producers, 16 soaking pits and a 30-inch bar mill. The open hearths have an annual capacity of 100,000 tons and along with the gas producers and part of the charging floor, were purchased from the Chambersburg Engineering Co., Chambersburg, Pa. The bar mill has an annual capacity of 90,000 tons. Operating in conjunction with the steel plant are 12 sheet mills, five mills for cold rolling and four mills for roughing.

After the steel from the furnaces is poured into ingots, it is transported to the soaking pits where it is reheated and thence to the bar mill. The sheet bars are sheared, loaded into railroad cars and shipped to the bar yard where they are unloaded and piled. They are heated in coal-fired furnaces and rolled into sheets. The products of the plant are black, blue annealed and galvanized sheets; eave troughs; conductor pipe; corrugated roofing and siding; stamped and beaded ceiling metal; spouting; metal shingles; and other formed roofing material.

The axis of the plant runs from east to west, the open-hearth furnaces being at the southwest end. The scrap yard shown in Fig. 5 lies east of the open-hearth building and is connected to it by a wooden trestle supporting a narrow-gage railroad track. Scrap is loaded into standard size charging boxes by

FIG. 2—THREE 35-TON OPEN-HEARTH FURNACES WERE MOVED FROM CHAMBERSBURG, PA., AND RE-ERECTED

means of locomotive cranes fitted with magnets. Four boxes are mounted on a truck. The material is then weighed on a platform scale and hauled to the open-hearth department by a narrow-gage locomotive.

The open-hearth building is 120 x 260 feet and is so arranged that when more furnaces are necessary, it can be extended westward. The sides and roof are sheathed with corrugated galvanized sheets manufactured by this company. The building has a monitor type roof and was erected by the Canton Bridge Co., Canton, O. Provision has been made for installing an overhead traveling crane for the charging side of the open hearths. A general view of the charging floor and the three furnaces is shown in Fig. 2. While the furnaces are rated at 35 tons they are at present producing 40-ton heats. Each furnace is equipped with three brick-lined charging doors which are operated electrically. The charging boxes are handled by a high-type charging machine built by the Pawling & Harnischfeger Co., Milwaukee.

Producer gas is used for melting the charge, each furnace being served by three hand-fired Rider producers. These are equipped with Porter type reversing valves and are housed in a building south of the open hearth structure. Coal is unloaded from a trestle along one side of the charging floor and charged by hand. Two Heine boilers rated at 300 horsepower each, operate in conjunction with the producers. Water from these boilers and for general use is obtained from wells 200 feet deep which the company was obliged to drill. Nearly all manufacturing concerns in Canton depend upon drilled wells for their water supply, only one small stream flowing through the city. The six wells sunk by this company have 6 and 12-inch outlets, the water being withdrawn by means of electrically driven turbines of the deep-well type.

The ladles into which the steel from the furnaces is tapped has a capacity of 40 tons. Producer gas is used for drying the newly lined

FIG. 3—INTERIOR OF SOAKING PIT BUILDING.

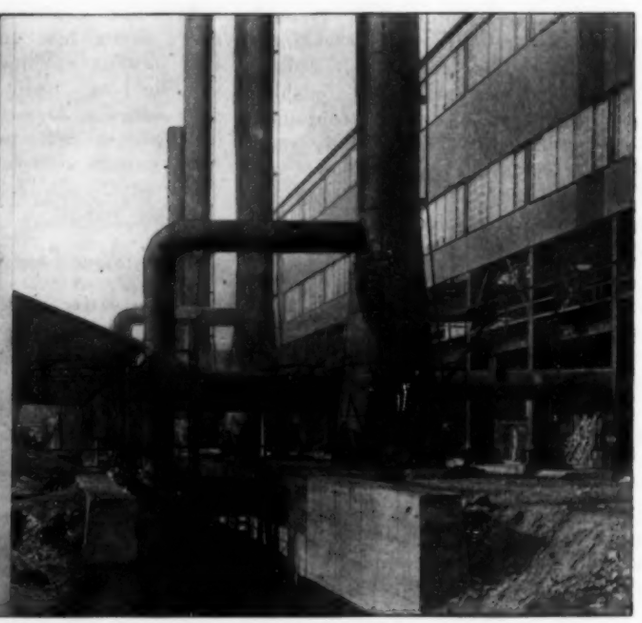


FIG. 4—GAS-PRODUCER DEPARTMENT AND GAS MAINS

ladles. For this purpose two double-type driers equipped with mushroom brick-lined hoods are installed. The ladles are handled by a 75-ton crane fitted with a 15-ton auxiliary. For lighter work around the pouring bay a 10-ton crane is used. Both cranes were built by the Cleveland Crane & Engineering Co., Wickliffe, O.

Ingots Are Bottom-Poured

Since sheet bars is the only semi-finished material rolled by the 30-inch mill, the practice is to cast the steel into ingots which weigh about 2000 pounds and measure 12 x 12 x 72 inches. In doing this the bottom-pour process is used. The molds are arranged in two groups of from 18 to 20 each. This number of molds is sufficient to hold one heat. Each group is made up around a master mold which is connected to the individual molds by suitable leads or runners near the base. The 40-ton ladle is suspended over the master mold by means of trunnion hooks attached to the big hook of the 75-ton crane. A clay-capped bott which is inserted in the tapping hole of the ladle governs the flow of metal. When the bott is raised, the molten steel flows into the master mold and the entire group of molds are filled simultaneously. The operation is controlled by a workman stationed on the pouring platform near the group of molds.

The ingots are given a reasonable amount of time to cool before they are stripped from their molds. On account of their being molded in such a small size it was not deemed necessary to install a crane-type stripper. The ingots are stripped by the 10-ton crane fitted with draw hooks shaped similar to ice tongs. Each mold is grasped by the tongs and elevated to a suitable height. Any bullheads or stickers are removed from their molds by means of an electrically-driven horizontal stripper.

After the ingots are cold, they are loaded into narrow gage flat cars and taken direct to the soaking pits. The pits are shown in Fig. 3. Two holes each containing four pits are provided. The covers are electrically operated. The furnaces are housed in a building 125 x 81 feet. The ingots are charged into the pits by means of a 10-ton Cleveland crane and a set of tongs equipped with an extension lever. The gas for these furnaces is generated in two Bradley producers equipped with three hoppers and recently patented reversing valves. The latter were built by the Blair Engineering Co., New York. The valves and controlling mechanism are housed in a leanto building, 100 x 33 feet, the former being installed at ground level and the latter on a balcony above.

When the ingots are brought up to a cherry-red heat, they are withdrawn from the pits and placed on a motor-driven ingot chariot which transports them to the bar mill. Most plants are laid out so that the haul from the soaking pits to the bar mill is as short as possible. However, this company has planned to install a blooming mill when operating conditions warrant and has left ample space between the soaking pits and bar mill for this purpose. The ingots are delivered in a heated state to the bar mill by the ingot car previously mentioned. This operates on a standard gage railroad track covered with a roof. The car is provided with a cab which protects the operator from the heat given off from the ingot while in transit between the two departments. As the car enters the bar mill building the ingot carriage is automatically tripped in such a way that the ingot is deposited on the approach table which serves the sheet bar mill.

FIG. 5—STOCK FOR THE OPEN-HEARTHS—THE TRESTLE LEADING TO THE FURNACES IS SHOWN AT THE LEFT

Roll Mill Equipment

This mill was built by the National Roll & Foundry Co., Avonmore, Pa., and consists of one stand of 30-inch, 3-high pinions and one stand of 30-inch, 3-high sheet bar rolls. The roll stand is of modern construction and is equipped with steel housings which weigh 41,480 pounds each. The bar rolls are 93 inches long and weigh 23,780 pounds. The pinions are of the inclosed type. They are mounted on massive shoe plates and connected to the roll stand by balanced spindles. The latter arrangement prevents undue wear on the roll wabblers and eliminates noise. The mill which has a capacity of 800 tons per 24 hours, will reduce a 2000-pound ingot to an 8-inch sheet bar in 11 to 13 passes according to the thickness desired. As shown in Fig. 6 it is enclosed in a steel building, 63 x 440 feet. The 30-inch unit is not fitted with manipulators although plans are already formulated to provide them in the near future. The top and middle rolls are chilled iron; the bottom roll is steel. The ingot is given its preliminary roughing between the bottom and middle rolls and is finished into a sheet bar by the bottom and middle rolls. The front runout table is 144 feet long.

The front and rear tilting tables, which are geared to individual 80-horsepower motors, are pivoted in the center. By the latter arrangement they are swung into action quickly so that little time is lost between successive passes. A 1500-horsepower Westinghouse motor drives the mill. It is supplied with current at 2200 volts. Attached to the shaft between the motor and flywheel is a liquid slip regulator. This provides an automatic retardation and acceleration of the flywheel and improves the peak loads of the mill while rolling. The motor operates at 234 revolutions per minute and is connected to the jack shafts through reduction gears. The latter were built by the Stoddard Machine Co., Wooster, O., and have a ratio of 3.71:1. The speed of the mill is therefore 63 revolutions per

minute, under normal operating conditions.

The mill motor is housed in the power house adjoining the bar mill structure. Current is supplied by the local electric power company at high tension. The voltage is stepped down by a transformer from 22,000 to 2400. This transformer has an oil capacity of 1940 gallons and is rated at 2000 kilovolt amperes. Two other transformers are provided. One lowers the voltage from 2400 to 230 and 115 for lighting purposes, operation of motors, etc., and the other lowers the voltage from 2400 to 59 volts for starting and 189 volts for running the convertor. The latter operates at 1200 revolutions per minute. A suitable switchboard is used to effect the speed changes of the mill motor and for the general control of the other equipment. In addition to the usual volt and ampere meters, the board is equipped with a self-recording kilowatt meter. All the equipment installed in the power house was furnished by the Westinghouse Electric & Mfg. Co., Pittsburgh.

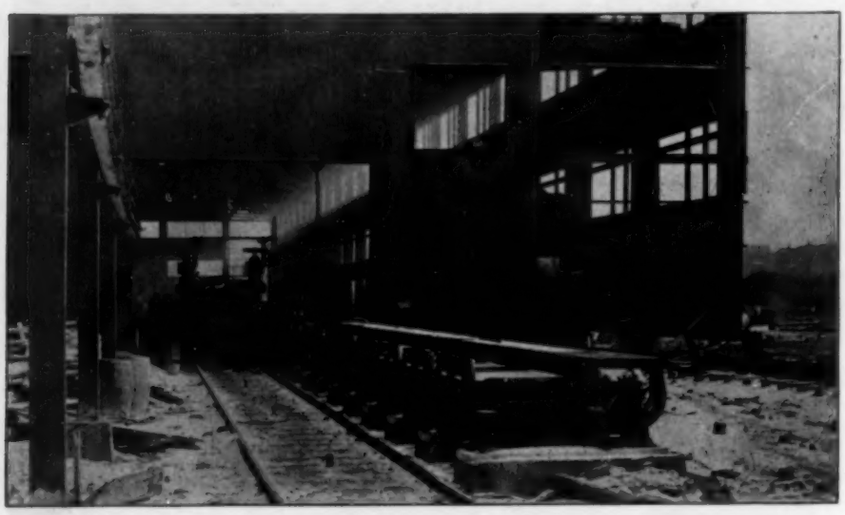


FIG. 6—RUNOUT TABLES WITH 30-INCH BAR MILL IN THE BACKGROUND

After passing through the rolls, the sheet bars are run out onto a cooling bed 210 feet long and transferred at right angles across a rail-type transfer table to the shear approach table. The latter is 228 feet long. The bars are passed direct to the shear where they are cut into multiples, each multiple making a sheet or plate, whichever is required in the finishing mills. The shear is equipped with a flywheel and a continuous running motor, the operator engaging a clutch when a cut is to be made. The multiples are discharged into a bar pit on the edge of which the shears are mounted. The present practice is to load the bars onto cradles and weigh them, after which they are shipped to the storage yard to await retransfer.

In the immediate future, however, the company plans to install an electrically driven underground conveyor which will connect the bar mill and sheet mill departments. This will permit the bars to be sheared while hot and delivered to the sheet mills. The storage yard is located between the bar and sheet mill buildings and is served by a railroad siding. This track is laid along the south side of the yard. The sheet bars are delivered by the railroad to the storage yard, unloaded by a bridge crane and piled a few feet away from the heating furnaces. This arrangement expedites the handling of the raw material for the sheet mills and reduces the number of labors required. Reheating furnaces receive the bars from the piles and heat them to a temperature suitable for rolling.

The sheet mill building is situated at the north side of the plant. Heavy gage sheets are rolled on 46-inch and 56-inch jobbing mills located at the east end of the building. Both are two-high mills and are fitted with electrically driven screwdowns. After the bars are heated in stoker-fired furnaces, they are placed on an L-shaped hook suspended on an overhead monorail and transported to the roughing stands about 20 feet from the furnaces. They are roughed down and transferred to the adjacent finishing stand where they are rolled to the exact gage. Sheets from the 46-inch mill are passed direct from the finishing rolls through a roll leveler and sheared. Four 126 and 156-inch electrically driven shears are conveniently located throughout the mill. The sheet trimmings are collected from around each shear and taken to a hydraulically-operated bundling machine. This machine compresses the scrap into bales and ejects them onto an inclined, electrically driven conveyor which discharges into cars outside the building. The bundled scrap is then shipped to the open-hearth department to be remelted.

Disposing of the Finished Material

Sheets from the 56-inch mill are conveyed slowly through a Costello continuous annealing furnace. After passing through a roll leveler which is placed at right angles to the furnace and driven by a 15-horsepower motor, the sheets are deposited on a three-strand chain conveyor. The speed of the conveyor is such that the sheets have ample time to cool before being trimmed by the jobbing mill shears. These shears are placed a short distance from the discharge of the conveyor. If a light gage is going through the mill, the heated sheet bars are rolled on the roughing mills and placed one on top of the other in pair furnaces for further heating. The packs are then passed through the finishing mill rolls until the desired gage is obtained after which they are sheared, separated and piled on a rack. The racks are then delivered to the annealing department in the west end of the sheet mill building. The mills and annealing departments are served by a 10-ton and a 30-ton crane.

The sheet mill heating equipment consists of 13 stoker-fired pair and sheet furnaces. The stokers are hand-fed and were installed by the American Stoker Co., New York. The seven sheet mills which were originally built in 1910 are rope-driven by a 34 x 60-inch corliss steam engine rated at 1200 horsepower. The engine is connected to four vertical boilers rated at 1300 horsepower. The gear and engine sheaves are 24 and 10 feet in diameter respectively and are grooved for thirty-two 2-inch wire ropes. An exact duplicate of the bar mill motor drives the two jobbing mills, four hot sheet mills, two cold mills and four roughing stands. It operates at 240 revolutions per minute. The motor is coupled to the various mills through reduction gears, the final one of which drives the mill rolls at 30 revolutions per minute.

To counteract the hardness imparted during the rolling process, the sheets are annealed before they are shipped. For this purpose nine double annealing furnaces are provided. Four of the furnaces are heated with producer gas and five are stoker fired, the coal being charged by hand. As previously mentioned, the sheets are delivered to the annealing department on racks which were designed by the officials of the Canton

Sheet Steel Co. The racks are placed in boxes fitted with cast iron covers. The boxes are then placed inside the furnaces, the temperatures of which are increased slowly to the desired degree, and left there for about 24 hours. The furnaces will accommodate 22 boxes.

When the sheets are properly annealed they are withdrawn, piled on trucks, and hauled by electrically-driven tractors to the assorting department. This department is located in the west end of a building which parallels and lies between the soaking pit and sheet mill structures. A brick wall extends lengthwise through the building and separates the galvanizing and forming departments from the warehouse and shipping departments.

After the black sheets are assorted they are either taken to the warehouse and shipping departments direct or they are put through a galvanizing process which protects them from oxidation. In this process the sheets are arranged in batches and submerged in dilute sulphuric acid to remove any scale. Four plunger type pickling machines are provided for this purpose. After about five minutes the batches are transferred to the wash tanks to remove the acid. They are then placed in feed tanks where they are given a further cleansing prior to being galvanized.

Galvanizing the Sheets

Eight cast iron galvanizing pots of the usual gas-fired type are provided. The sheets are passed through rolls which are immersed in a bath of liquid spelter, the last set squeezing off the surplus zinc. These rolls discharge the sheets onto a chain conveyor which transfers them to the shipping department where they are inspected. They are either loaded into cars, transferred to the bundling tables or sent to the forming department. The warehouse and shipping departments are shown in Fig. 7. The company's active interest in the welfare of its workmen is demonstrated by the conveniences found in these departments. They are provided with wood block floors and an abundance of light. In order to heat the room comfortably in winter, two large fans are kept in operation and distribute hot air through overhead pipes.

Products manufactured from galvanized sheets by this company are fabricated in the forming department which is located in the east end of the galvanizing, shipping and warehouse building but is separated from them. The forming business carried on by this company last year increased to such an extent that larger quarters were imperative. The foundations for a new building were prepared last fall and as soon as the weather permits construction of the building proper will commence.

An up-to-date thoroughly equipped chemical laboratory is operated in connection with the plant. Raw material for and the steel from the open hearths as well as the finished product from the sheet mills are analyzed with care. Great stress is laid upon this work. To maintain a stable labor supply, the company has erected at its own expense four large buildings which are equipped with steam heat, shower baths, electric lights, etc. They provide homes for 300 men.

The officers of the Canton Sheet Steel Co. are: J. H. Foster, president; C. A. Irwin, vice president and general manager; H. A. Roemer, assistant general manager; H. S. Renkert, second vice president; H. P. McIntosh, treasurer; S. H. Tolles, secretary; George T. Thomas, general sales manager.

FIG. 7—GALVANIZED SHEET WAREHOUSE AND SHIPPING DEPARTMENT

Railroad Reclaims Scrap

Charles E. Parks in an article in *Railway Magazine* describes the economy obtained by the Atchison, Topeka & Santa Fe railway in saving scrap. The early practice looked only to a large showing in scrap sales, and consequently a great amount of really valuable material was junked. The discovery of this leak led to a reclamation plant for collecting, sorting, classifying and remaking when possible all scrap from the entire system. About 650 men and a number of women are employed in the department at present, and a large saving has been effected in addition to the profit made on scrap sales.

Since 1911, approximately 140,000 tons of scrap have been handled annually at the scrap yards. During that year 143,142 tons of scrap material were sold for about $1,000,000, or at the rate of $7 a ton. In 1916, 139,789 tons were sold for $2,003,820, or at the rate of $14.33 a ton. During the first nine months of 1917, 120,115 tons were sold for $3,160,613, or for $26.31 a ton, or nearly double the price of a year ago. The cost of handling 140,000 tons of scrap in 1911 was approximately $50,000; in 1916 it cost $103,368 to handle the same amount, while during the first nine months of 1917, it cost $162,784 to handle only 120,115 tons. Although the price of scrap has advanced nearly 400 per cent in seven years, the cost of handling also has advanced in about the same proportion. The material which is reclaimed is turned back to the company's storerooms. The saving from this source probably approaches in value, if not in cost, the total of scrap sold.

Indian Ore Uniform

The uniformity of oriental Indian manganese ore is brought forth in a table of analyses covering 27 cargoes imported by the Matthew Addy Co., Philadelphia, which has been compiled by William W. Hearne, managing director of the company in Philadelphia. These various lots show a range of from 50.080 to 53.071 in manganese; from 4.980 to 7.975 in silica; from 0.054 to 0.114 in phosphorus, and from 0.335 to 1.143 in moisture. Of the steamer lots analyzed, 23 were imported during the season of 1917.

Tool Steel Gears for Mill Service

Long Life and a Supplementary Saving in the Cost of Installation Are Important Factors Recommending the Use of Gears With Hardened Surfaces for Severe Service

BY E. S. SAWTELLE

THE material covered in this discussion is treated by a special process which for purposes of comparison must be likened to case-hardening, though in the results obtained it differs radically from case-hardened gearing. The likeness consists in the fact that both materials are made from a low carbon steel, preferably, about 0.20 per cent, that they are subjected after manufacture to a carbonizing process which changes the chemical content and after this they are heat-treated and quenched for hardening. The dissimilarity lies in the fact that entirely different ingredients are used in the carbonizing process, giving a much deeper and more uniform penetration, a material which is free from virtually all of the defects and hindrances common to the ordinary case-hardened gear. Whereas in case-hardening, it is usually impractical to penetrate to any considerable depth, with this particular method a depth of as much as 3/16 inch to ¼ inch can be readily obtained. Throughout this depth the hardness is virtually uniform instead of tapering off from a very hard skin on the surface to the soft center as in case-hardening. This is particularly noticeable owing to the fact that the wearing qualities are maintained until the complete depth of hardness has been worn off, instead of having an acceleration in wear after a surface skin has been penetrated. The hardened wearing surfaces are particularly free from some of the most embarrassing case-hardening difficulties, such as peeling, scaling, etc.

It is quite evident that most of the differences described are more or less intangible when it comes to an inspection of samples, but they have been very readily demonstrated in careful service tests covering a period of approximately 10 years. This feature is best illustrated by the fact that this particular grade of material is being successfully used in such service as crane track wheels, where to the best of my knowledge no one has had the temerity to even offer a case-hardened part.

Obviously for gear service a composition with a glass-hard wearing face and a soft and tough center is ideal, and gives much better wear and strength than anything obtainable by the use of a homogeneous steel, heat-treated or quenched for toughness and hardness, but where neither of these can be obtained at their maximum since the hardening tends to brittleness, and the toughening tends to softness.

Methods of Manufacture

The general method of manufacture is, first to machine the part throughout, then raise the carbon content for the desired depth to approximately 1 per cent, protecting the bores so that they retain their original chemical properties. A series of heat-treatments refines the grain and hardens the piece, at the same time very decidedly toughening the center. While it is possible to protect the bore, or virtually any surface where a junction of steel on steel perfectly tight can be obtained, it is practically impossible to do selective hardening by protecting certain parts with special paints, copper plating, or similar methods. The penetrating qualities of the carbonizing agent are such that these methods, common to case-hardening, are absolutely noneffective. A certain amount of selective hardening can be done at decidedly increased expense by leaving the parts large, raising the carbon content to an equivalent of tool steel, annealing, and then turning off the piece in the parts to be left soft until the high carbon material has been completly removed. After this operation has been completed, the piece is hardened by quenching and heat-treatment; the surfaces that have been machined after the impregnation process will remain soft.

Chemical and Physical Properties

As has already been stated, the center of the gear remains of the same analysis as the initial material which is approximately 0.20 per cent carbon steel. This steel responds somewhat to the proper kind of heat-treatment and when backed up on either side by a hard and more or less rigid substance, gives unusual strength. The wearing surface will run from 0.90 per cent to 1.20 per cent in combined carbon, and as such, is entirely similar to high-grade carbon tool steel, such as was used for lathe tools prior to the advent of high-speed steel and is now being used extensively on drills, etc. This method of hardening is being used to some extent for tool work, especially for taper reamers, and as such is giving life fully as good as from carbon tool steel.

Exact physical properties are unobtainable owing to the two-fold nature of the material, which does not lend itself to reliable physical tests. Obviously a test of the center would not be characteristic of a test of the piece. In actual gear service tests, it has been demonstrated that the combination of the two hard surfaces with considerable rigidity backing up the very tough center gives a tooth that has greater strength and greater resistance to shock and strain than does the high carbon untreated gear or the gear of homogeneous steel that has been quenched for toughness. The hardness of the outside wearing surface will run from 90 to 100 on the scleroscope and is too great for accurate test on the Brinnel instrument. A sharp corner can be used to scratch glass without difficulty. In connection with the subject of physical properties, it must be borne in mind that the only true criterion is to test out the actual piece itself rather than a small test bar which may be prepared in a way somewhat or exactly similar. I believe that the latter method is very deceptive since the internal heat in the test bar is very small, whereas in the gear it is much greater and tends to retard the cooling and to give properties that are quite different from properties that can be obtained from the small piece responding immediately to the action of the heat or quenching agent. Very frequently astonishingly good physical properties can be obtained by a heat-treatment of the small test piece, but they are not comparable with the properties obtained when a large piece of steel is handled in the same manner. For these reasons, we consider that the only fair durability test is on gears in actual service.

Inasmuch as the gears are machined before they are subjected to the hard-

A paper presented at the recent Philadelphia meeting of the Association of Iron and Steel Electrical Engineers.

ening process, it is essential that precautions be taken to have them correctly designed so as to avoid distortion. It takes years of experience to know the proper way to handle gears, keeping them true to their original shape. Despite all the theoretical calculations on the subject of distortion, it resolves itself down very largely to a matter of past experience applied to the individual cases at hand.

Distortion is nearly always encountered in the nature of shrinkage, running usually about 1/64 inch shrinkage for each foot in the diameter. This, however, depends considerably upon the pattern and design, since if these are not properly balanced and established, there may be a great deal more shrinkage and a decided distortion in addition. Very frequently pieces must be tempered in specially designed jigs to keep them straight. In a gear running from 24 to 50 inches in diameter, properly handled there should be very little distortion out of plane, not running more than about 1/32 to 1/16 inch at the most. When the decrease in diameter through shrinkage is balanced up and figured on the basis of radius instead of diameter, it is too small for any practical concern in the average run of mill or electric railway motor car gearing. Pinions are frequently made as a unit with some shaft, such as is the case in the typical mill pinions, or in some cases armature pinions, too small to be detached from the shaft. In a case of this sort there is apt to be a certain amount of kinking or distortion in the shaft, especially if it is long; this can be corrected by making it oversize and grinding after the hardening operation. Inasmuch as the shaft has a soft, tough, pliable center, it is possible to straighten it cold within reasonable limits before the grinding operation.

The natural tendency is for distortion to cause noisiness and excessive vibration, but we have found by experience that this can be kept down so that is causes no annoyance in installations where the speed is excessive. In one case, a continuous rod mill is operated through gears of 18-inch pitch diameters at 1123 revolutions per minute, giving a peripheral speed of approximately 5292 feet per minute. Another rod mill with gears of 20-inch pitch diameters operating at 955 revolutions per minute, gives a peripheral speed of 5000 feet. We have numerous cases of 28 and 29-inch diameter electric railway motor gears which will operate at a peripheral speed of as high as 4000 feet per minute, and yet these gears are quiet in their operation. The test in electric railway service is unusually severe as the least indication of excessive noise causes severe criticism. In careful tests on both machine molded cast-tooth and on cut-tooth spur gears up to 6 feet in diameter, the distortion is found to run so slight as to be detected only with delicate calipering instruments. In hardening mill pinions up to 10 feet in over-all length we have found that the distortion is almost negligible excepting that a slightly greater allowance must be left for grinding the bearing surfaces.

Intermating Hard and Soft Gearing

The question as to the desirability of running hardened pinions with soft gears, or vice versa, is one of considerable importance and one that has been carefully checked in numerous tests. These tests have indicated that it is wholly unwise to run the hardened steel pinions with cast iron mates, that it is not advisable to intermate the hardened steel pinion with a very low carbon gear, especially under 0.30 per cent. It is, however, good practice and entirely proper to intermate the hardened pinion with a gear where the carbon content runs higher than 0.30 per cent, the higher the carbon the better the combination. In case the hardened pinion is run with the untreated steel gear, experience has shown that the combination is always detrimental to the fullest service of the pinion. Whereas a hardened pinion mated under the same conditions with a hardened gear will last from seven to ten times as long as the ordinary untreated 0.30-per cent carbon steel pinion, if it is mated with a soft gear, it will only last from four to six times as long as the 0.35-per cent carbon pinion. The effect upon the gear is generally conceded to be good, owing to the fact that the hardened pinion retains its full tooth shape and contour for a very long period of time and takes on a high polish, which tends to curtail friction and reduce the gear wear.

It is, however, considered by far the best practice wherever possible to mate hardened pinions with hardened gears.

General Advantages

The primary advantage in using the hardened gear is the long life. Service tests have demonstrated its ability to wear from seven to ten times as long as the ordinary untreated gear and at least twice as long as any other grade such as case-hardened, heat-treated, manganese steel, mold-hardened, etc. Coupled with the long life is a decided saving in installation cost where a hardened gear once installed will avoid numerous replacements, with incidental saving in freight and storeroom charges. Loss of output is no small consideration in this connection. As an illustration, we know of several steel mills where their cost for the installation of a $10 pinion runs into hundreds of dollars unless the change can be made on one or two national holidays when the plant is shut down. This loss is not in the nature of direct labor, but because of reduced output.

It is frequently the case that one or two gears are the limiting factor in a machine; the only solution is to increase the size of the gears or to improve the quality: The former is usually a very expensive remedy since size increase in gears must be accompanied by corresponding increases in housing, bearings, etc. In such cases, the hardened gear proves of tremendous usefulness. In designing new machines, the size of the gears can be greatly reduced and thereby their cost cut down by the substituting of a long-lived, high-quality, high-strength hardened gear in place of the ordinary untreated material.

It is a decided advantage to have the hardened gears so protected on the bores and keyseats that they can be machined to an exact fit before application, and even if necessary, have this machining operation done in the customer's shop to fit nonstandard shafts.

In cast-tooth gears, it is possible to make accurate and uniform teeth in low carbon castings, so the gears run quietly after hardening. It is further of decided advantage that before the hardening process the teeth are soft and any irregularities or bumps can be readily filed or machined after the casting is made. This condition applies either to pattern cast gear with cast teeth or to gears with cast teeth, formed by machine molding. In either case it is always desirable to slightly clean up the teeth after the casting operation.

It is exceedingly difficult to keep accurate records in mill operation and get close comparisons to show quality in gearing. As a rule, the severest service in any particular place is selected for a test. We are citing a number of cases of this sort showing the results obtained, doing this with the thought that these instances may offer suggestions of specific places where the hardened gear will prove of advantage in other mills or services.

In electric railway motor car service both wear and strength are absolutely essential factors, owing to the continual increase in the horse power of the motors which has not been accompanied by a corresponding increase in the size, pitch or face of the gears. In this service, accurate tests are obtainable, as there are four motors under the car, and it is possi-

ble to equip part with special gears and part with ordinary grades and check the relative life. This has, therefore, been a field where virtually every quality of gear has been tried out; untreated, oil and water-quenched, and case-hardened. In this service gears with tool steel wearing surface have invariably proved their superiority on a basis which entirely eliminated the untreated gear from the calculations and which has outstripped the various special gears in ratios of from two or four to one. Kindred to the electric railway field are the motor gears for coal-mining locomotives and machines and the mill motor gears and pinions. These types of gearing are almost invariably cut-tooth and of comparatively fine pitch. Gears in the cement mills, steel mills and foundries operate in unusually dirty and dusty atmosphere which greatly accelerates wear. A test was followed in cement mill service where the ordinary untreated pinion lasted eight months; the hardened pinion in this service has now been in use slightly less than three years and shows about one-third as much wear as is normally allowed. In a steel mill ladle crane test, in a particularly troublesome location, ordinary pinions had been lasting 4½ months; a heat-treated, oil-quenched pinion was installed which lasted 11¾ months. After this a hardened pinion was applied, and it was in service 32 months, and when removed was not entirely worn out.

Rod mill pinions, operating at exceedingly high speeds, are normally subject to considerable breakage, especially after the pinions become worn. We have several cases where the application of the hardened gear to this service has eliminated wear, kept the machinery in smooth operation and absolutely without breakage, though the tests have run from two to three times as long as the life usually obtained from ordinary pinions.

Roll Mill Gears

A test was followed in blooming mill screw down service, where the untreated motor pinions average only two months of life, due to excessive wear. The hardened pinion is still in service, after over one year's use, and is now about half worn out.

Cast-tooth table miters are usually worn out rapidly and the ones next to the rolls are subject to breakage strains. Tests in this service have been run in numerous mills comparing with untreated, mold-hardened, and manganese steel. In comparison with untreated gears, the hardened ones have now lasted twice as long, and show barely a polish on the teeth. As compared with mold-hardened, experience has shown about a 3 to 1 ratio of life, and about 2½ to 1 in comparison with manganese. Compared especially with teeth unmachineable after casting, gears with tool steel wearing surfaces are much more satisfactory, by reason of tooth smoothness with reduction in vibration and noise. Hardened gears have demonstrated themselves to be proof against breakage due to the toughness of center of teeth. A number of steel mills are now standardizing on hardened material for their staggered tooth spur mill pinions, basing these decisions upon long life and strength in the pieces, and upon the fact that the wobblers can be accurately machined and then hardened to reduce excessive wear and play. In one case tests are now being run on hardening the coupling box as well as the wobblers.

Because of the grittiness of coke dust, there is a considerable field for hardened gears in coke machinery. A hardened cast tooth, shrouded spur rack pinion on a beehive oven coke drawing machine, drew 9000 ovens of coke after which it was worn about one-third as much as allowable. The untreated steel pinions in this service average 2870 ovens when completely worn out. Grit and dust are decided factors in gear wear on crane service, especially in foundries.

Tool steel wearing face is found desirable for certain other classes of work, such as on track wheels and sintering chains. In the track wheels, the hardened wearing surface is a protection against rapid tread wear and is especially valuable for prolonging flange life if rails are not in perfect alignment. Poorly lined rails will frequently cut out the softer steel wheel, or cause the flange to peen out of shape or to break. Breakage in the tool steel wheel is obviated by the toughened center of the flange. While track tests have not been followed on as extensive a scale as gears and pinions, a number of the large mills have now reached the point where they are continually sending repeat orders, and in one case the hardened wheels have been in service 5½ years as compared with eight months, the average life obtained from cast steel wheels. Wherever it is possible to obtain forged material, the track wheels are made from forged or rolled steel blanks, or from solid forgings.

Very exhaustive tests have been made in one of the large sintering plants leading to their standardizing on hardening chain. In this particular service 1-inch chain is used in endless sections 240 feet long, and is continually circulated through sintering kilns carrying scrapers to keep the sides of the kiln clean and stir and break up the iron to be reclaimed. The temperature of the kiln is very high and would ordinarily draw the temper of the hardened chain, but this is obviated as the chain moves through in less than a minute and is for a corresponding time submerged in a bath of cold water on the outside. In this service, numerous grades of chain were tried, the best of which lasted from six to 10 days. Removal was due to excessive wear and frequent breakage on the part of the worn links. Hardened chain has lasted from 92 to 100 days, and thus far has given no breakage trouble excepting in one or two cases, where defective welds in the links have opened up. In this service the hardened chain has been successfully used for over a year.

Sintering chains are not subjected to excessive strains and while hardened chain can be satisfactorily used in this field, it cannot be recommended for service where there is not a large factor of safety against breakage. This is due to the fact that in chain the strain is entirely a tensile pull and the hardening reduces the strength. On the other hand, gearing is subjected to a compression rather than a tensile stress.

The mill industries, especially in the gearing fields, continually offer problems that are baffling. There is an increasing tendency to solve these permanently by the use of the highest quality. There is probably no other field where economies are greater and the elimination of annoyances more noticeable than where quality gears are used to solve gearing troubles.

War Aid the Keynote

The spring meeting of the American Society of Mechanical Engineers will be held at Worcester, Mass., June 4-7. The primary purpose of this meeting will be to bring out suggestions for making the society an even greater factor in war service. At the sessions devoted to the conduct of the war, papers covering the utilization of nonessential industries, shipbuilding, the manufacture of all classes of arms, aircraft procurement, supplies and labor will be presented and discussed. This will be in addition to the general sessions for papers on research, design, construction and other technical subjects.

The S. R. Avis Arms Co., West Haven, Conn., which recently closed its plant because of the cancellation of the Russian gun contract, has received orders from the government and will resume operations again in the near future.

Crane Demand Parallels Ship Need

Shipbuilding Program Causes Intense Production Activities Among Crane Builders —Few Newcomers Among Makers—Augmented Manufacturing Capacity Due Mainly to the Installation of Modern Equipment

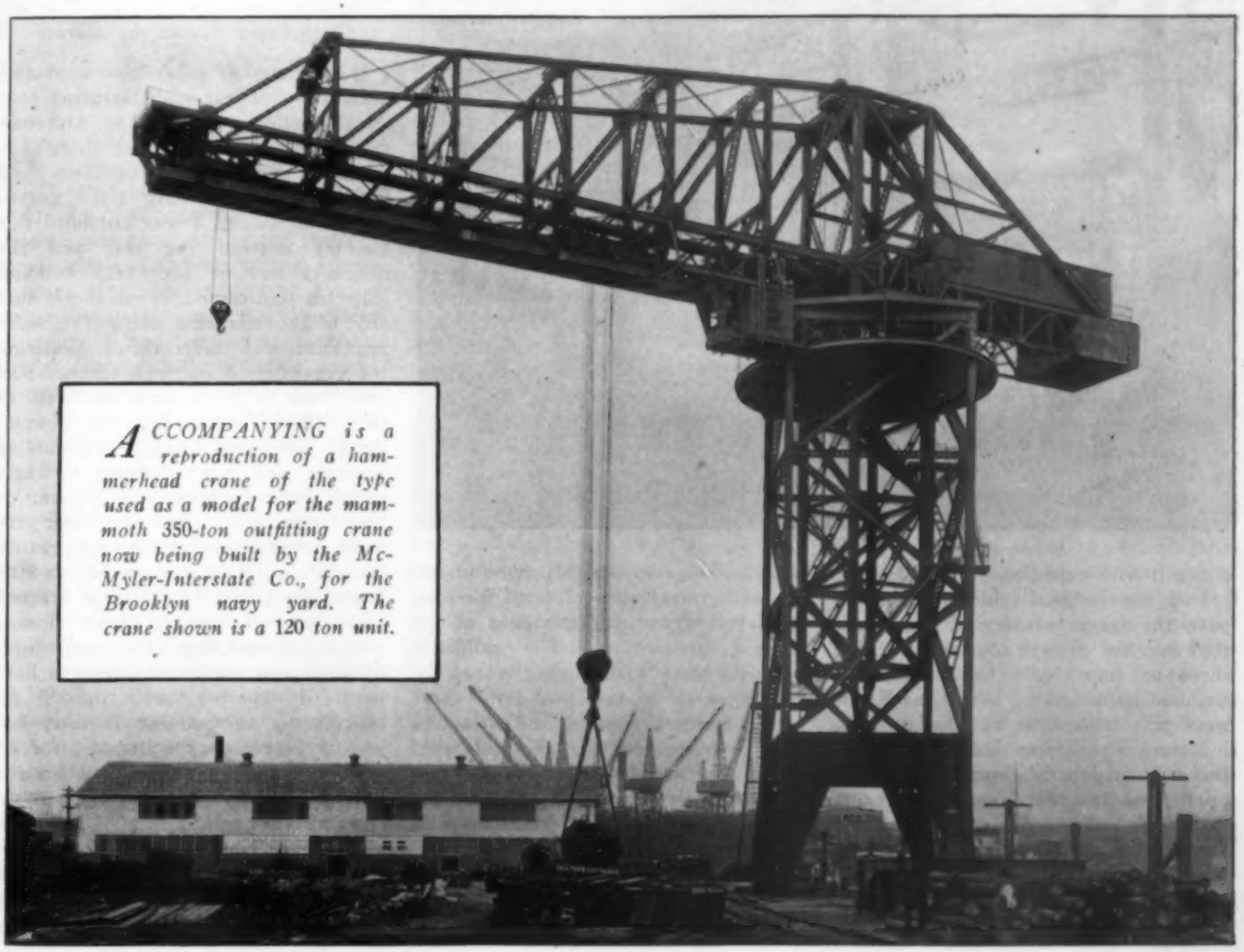
BY B. K. PRICE

WHEN an ancient Egyptian king became particularly hard pressed by ambition, he not infrequently would turn his attention to some unusual feat in construction. He would call before him all of his male subjects from throughout the land. He would outline his project, and, in the language of the day, tell them to stir around and get busy. And so, equipped with crude instruments and ropes and indomitable perseverance and courage, his subjects would set out to do his bidding. They would tug and pull and push and heave and finally after an elapse of five or 10 or possibly 20 years, they having completed their task, would sit down for a well earned rest. This, in simple terms, is the story of ancient engineering achievement, as handed down through the centuries of tradition. Precisely how these curious ancient builders moved and lifted the huge masses of stone embodied in some of their larger structures, nobody knows. One ancient writer ventures, what is regarded as a rather sound guess, that they were aided by crude sheer-legs with a primitive windlass and pulley block tackle. Their heavy lifting, according to this particular writer, was done with sort of a guyed derrick, but without the boom, and, with the lack of evidence that anything better was employed, the majority of the present day scientists appear willing to give this ancient scribe the benefit of the doubt.

Crane Dates Far Back

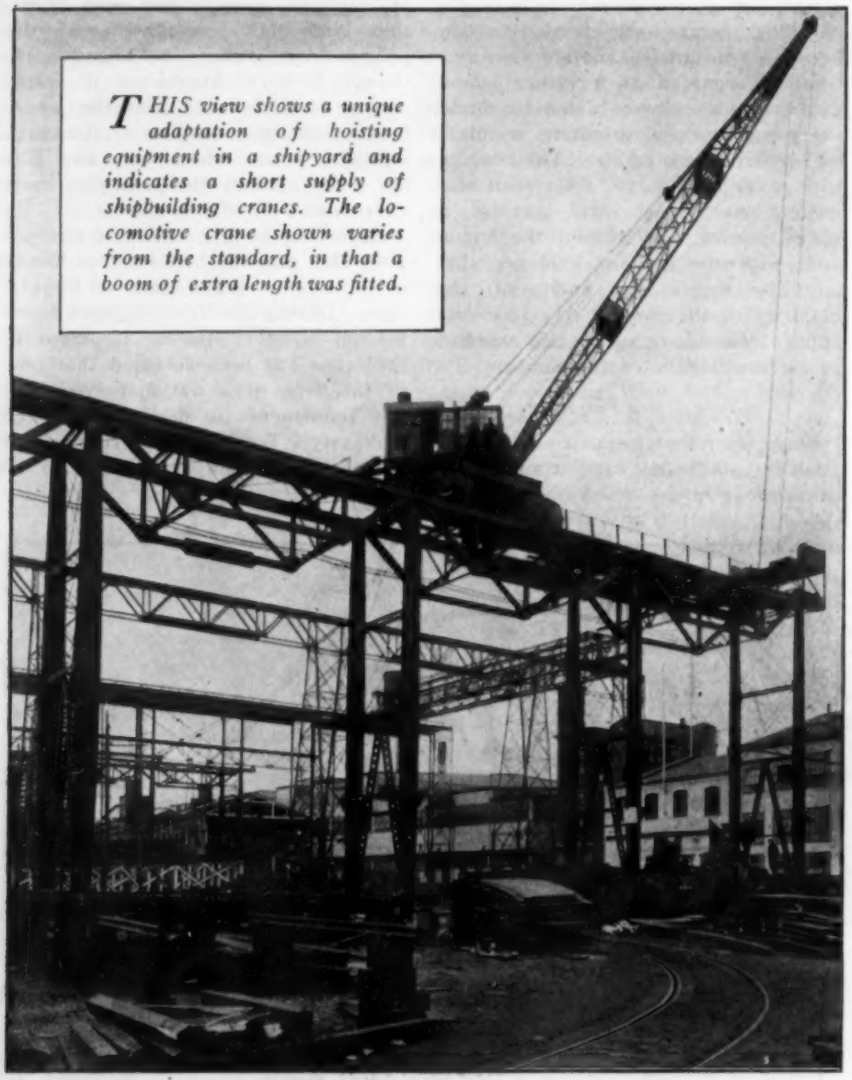
Since man first began to build, the problem of lifting and transporting great weights has taxed his ingenuity to the utmost; and it may may be regarded that with the construction of buildings—even of the most primitive kind—the development of the present day crane was begun. Although little is known of its early stages, it is believed that the under branced swing crane, the derrick with swinging boom, sheer legs and lifting jacks, embody the principles most widely used by the ancients.

According to all records, it was not until 1850 that the first real semblance of the modern crane made its appearance. During the 50 or 60 years intervening, however, the development of the crane has been so rapid that now in the face of a national crisis but few refinements in design have been necessary. Today it is playing a part in the conduct of war second to no other piece of machinery. From one



ACCOMPANYING is a reproduction of a hammerhead crane of the type used as a model for the mammoth 350-ton outfitting crane now being built by the McMyler-Interstate Co., for the Brooklyn navy yard. The crane shown is a 120 ton unit.

end of the country to the other, in every iron and steel plant and in every munition plant, on the iron ranges, and along all channels of traffic may be seen the crane, lifting and pulling—carrying in the most actual sense its share of the war's burden. To its lot falls the responsibility of relieving millions of men for other work, urgently needed in the successful prosecution of the war. It not only is executing this task, but is doing it with expediency and dispatch.



THIS view shows a unique adaptation of hoisting equipment in a shipyard and indicates a short supply of shipbuilding cranes. The locomotive crane shown varies from the standard, in that a boom of extra length was fitted.

Due to the particularly prominent part, the crane industry is playing in the war, its growth during the past three or four years has become of national importance. When the European war broke out in August, 1914, it found the crane industry in the throes of a general depression. Plant operations had been considerably curtailed for months, and as a result of heavy cancellations cranes were plentiful. In one instance, as high as 50 cranes were reported in the yard of one large builder. In the savage competition which naturally accompanied this depression, prices in many instances were sharply cut by manufacturers in an effort to meet their payrolls and keep their plants in operation.

Allies Start Big Buying

It was not until after the first half of 1915, when the vast buying movement of the entente had gotten well under way, that the first real demand for cranes developed. Munition plants required conveying equipment for new construction and the handling of increased production. The railroads needed cranes to handle the rapidly swelling flood of traffic, and the shipyards were becoming more active throughout the country. Considerable export demand developed, particularly for locomotive cranes needed in expediting the erection of railroads and the movement of supplies in the war zone. In October of that year demand, as it appeared shortly after, had reached unparalleled proportions. Prices, however, had not begun to show any material increase, capacity was practically unchanged, the shops being capable of turning out about 80 locomotive cranes a month and perhaps two or three times that number of electric cranes. Few new companies had entered the field up to that time. During the 12 or 15 months which followed, production was steadily increased, until the output of locomotive cranes had reached approximately 120 a month. This was not brought about so much by plant expansion as by the installation of new and more modern equipment. In electric cranes, the increase in production was considerably greater, due not only to the larger number of plants in the first place, but to greater plant expansion, and to the entrance of several new companies into this particular field. However, in a broad sense comparatively few new companies have taken up the construction of cranes during the past three years. When this country entered the war last April and a heavy demand for cranes was practically assured for many months to follow, official Washington was in receipt of many proposals from people who build cranes. By far the majority of these propositions, however, were squashed.

Shipbuilding Booms the Market

It was shortly after this country's declaration of war with Germany that the shipbuilding boom set in. Although the operations at yards along the Atlantic and Pacific seaboards and Great Lakes had long since gotten under full swing, it was not until this country entered the war and the necessity became acute for building ships in undreamed of numbers, that any large expansion along shipbuilding lines was undertaken. Realizing the urgent need of ships to transport men and to keep them as well as their allies in supplies, the government instigated huge shipbuilding projects and fostered others where trustworthy backing was shown. It was from this expansion that the crane industry has received its greatest stimulation. At the government's Hog Island plant, the largest to be erected, approximately sixty-five 25-ton locomotives are in operation. The requirements of other new merchant shipyards have been of tapering proportions. Although the shipbuilding industry has greatly increased the demand for all sizes of cranes, it also has been a potent factor in the development of larger cranes. Machines of large capacity have been made necessary particularly for fitting out ships. A type of this crane is shown on the preceding page. It is a stationary hammerhead

crane, with a capacity of 120 tons at a 60-foot radius or 50 tons at a 100-foot radius. It has a clearance under the hook of about 90 feet. A similar type, but of 350 tons capacity, is now being built by the McMyler-Interstate Co., Cleveland, for the Brooklyn navy yard. This will be the largest crane in the world. Two other cranes of similar size have been considered by the government, but have not been placed. A crane which may be considered in many respects as having been developed for use particularly in the erection of ships, is a stiff leg derrick, which is mechanically operated, and mounted on stationary towers. These cranes are so located and are of sufficient number as to control the shipbuilding operations on two adjacent ways. This type of crane is extensively used at the yards of the Submarine Boat Corp. and the American International Shipbuilding Co.

Aside from the increased capacity of cranes in many instances and the changes in supplemental construction, which has been necessary particularly for the erection of ships, conveying equipment has undergone but few innovations. A case in point in the later instance is shown on the preceding page. It sets out strikingly the steel construction around the shipways of the William Cramp & Sons Ship & Engine Building Co., Philadelphia. Although the boom is of unusual length, it may be noted that the crane is of the standard locomotive type. Several overhead traveling cranes are also in operation at this yard for handling material at the shipways. Some of these cranes have spans of 150 feet, which in this respect equal anything known in crane construction. These cranes have a capacity of 10 tons, and are mounted on runways 95 feet high. Overhead travelers also span the shipbuilding berths at the yards of the Bath Iron Works, the New York Shipbuilding Co. and several other companies.

At the Fore River Shipbuilding Corp. an unusually interesting bit of construction was undertaken at one of its ways with a view toward expediting the movement of material required in the construction of battleships. Steel towers more than 150 feet high were erected on either side of the shipway. These towers support two sets of runways, one approximately 150 feet in height and the other about 125 feet. On the lower track a 50-ton overhead traveling crane has been installed, while on the other track a 7½-ton traveler, with a slightly longer span, has been placed in operation. According to this arrangement, either crane can work over the entire shipyard without interfering with the operation of the other. Although several other interesting systems have been installed at various yards whereby the heavy and light capacity travelers can be brought into operation at the ways, this construction at the Fore River yard, due particularly to its immense size, is most unique.

At present the crane capacity of the country appears capable of coping with any demand that may arise, at least in the near future. Deliveries on both locomotive and electric cranes are improving, shipments now being obtainable in from three to four months and in some cases sooner, whereas up until recently cranes could be had under five or six months. Nevertheless, in spite of the fact that conditions in the crane market are now somewhat easier, it is believed that the further expansion of industry, as outlined in the government's huge war program, will insure a continued good demand for cranes from the shipbuilding interests for many months to come until present needs are filled.

Forced Lubrication for Turbines

AN EDITORIAL in *Engineering*, London, discusses forced lubrication for marine turbines, and points out that with the more or less general adoption of geared turbines on all classes of ocean-going vessels, in most of which, unlike the English navy, there are only two engineers on watch, it has become necessary to give the subject of lubrication considerable thought with a view to obtaining a degree of simplicity and dependability which will reduce attention to a minimum.

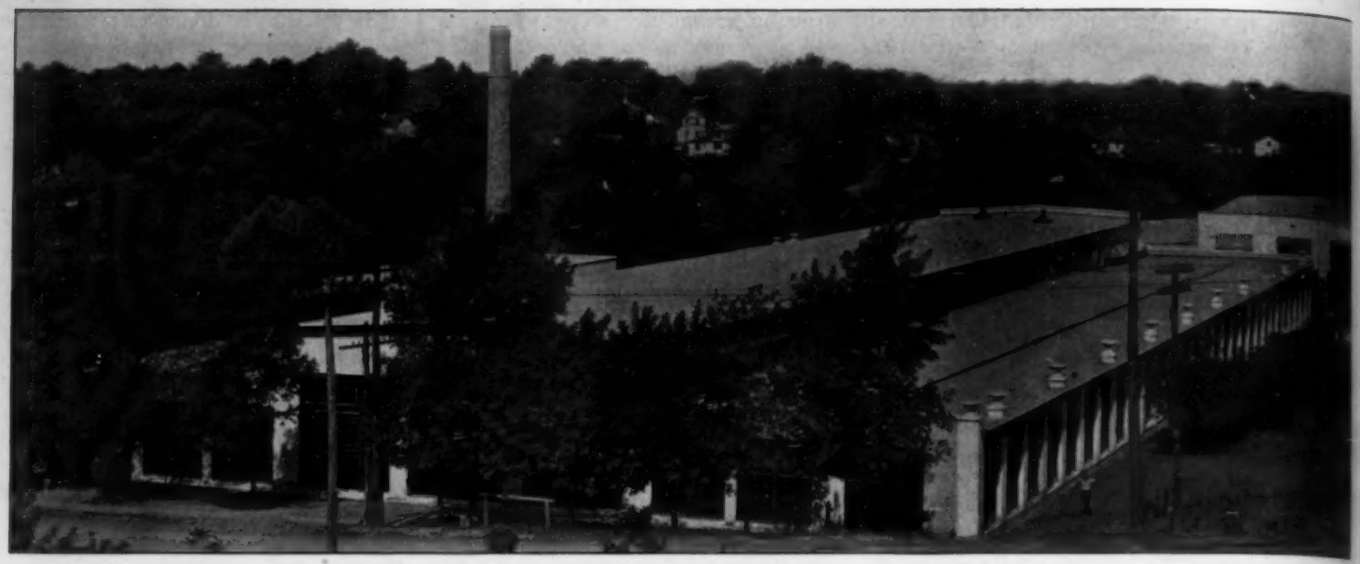
The article describes a combined gravity and forced system consisting simply of a pump taking oil from a drain tank and discharging it through a cooler to a gravity tank, from which it falls to the turbine bearings, etc., and back to the drain tank; or it can be by-passed, in which case it does not enter the gravity tank but is forced direct to the machinery. The following main fittings would be required for such a system, and are stated in the order in which the oil would pass through them when traveling from the drain tank to the turbines; one drain tank; two oil strainers, one for each pump; two pumps, one working and one stand-by; one oil cooler; two gravity tanks; one combined oil distributor and water-and-sludge collector.

The drain tank should be of sufficient capacity when full to supply oil for 15 minutes, assuming that none is returning to the drain tank. It should be a self-contained unit placed in a cofferdam in the double bottom rather than built into it, and should be easy of removal for examination. The top should be not less than six inches below the bottom of the gear case to insure a ready drain, and not less than three inches above the double-bottom tank to clear bilge water. In addition to the drain and suction-pipe connections a float-level indicator can be fitted so as to be easily observed from the starting platform.

The body of the oil strainer may be of cast iron, having a cover easy of removal. The straining grid may be a gun-metal casting or a steel tube perforated with holes, say, 1 inch in diameter, but in either case the area through the grid should be about 10 times that of the suction pipe. A suitable straining medium is a 24-mesh wire gauze, which should be properly secured to the grid. The gauze will, however, reduce the effective area through the grid by about one-half.

The oil cooler may take the same form as a steam condenser, with similar tubes and packing, but with the water circulating around the outside of the tubes with preferably a four or six flow to insure good circulation. As, however, it is economically impossible to render the flow of oil turbulent, which makes the rate of heat transfer low, certain firms construct their coolers in a different way. The water is passed through the tubes, and the oil outside. Numerous baffles are fitted to cause the oil to flow up and down in zigzag fashion across the cooling tubes, and at each abrupt change in direction a certain disturbance is produced in the laminar flow of the oil, which facilitates the interchange of heat. At present, knowledge of oil coolers is in its infancy and there is much room for research.

The combined oil lubricator and water-and-sludge collector need be nothing more than a cylindrical casting of sufficient depth to admit of water and sludge gathering at the bottom while oil flows out at the top to the bearings and gear sprayers.



Panoramic View of the Plant of the Clark Equipment Co., Buchanan, Mich

Manufacturing High Speed Twisted

BECAUSE a flat high-speed drill, suitable for shallow work, would not lift its chips from a depth greater than one and one-half times its diameter, a manufacturer heated a flat drill and twisted it so the inclined plane would elevate the chips and give deeper penetration. In that act the "twist" drill, so-called because it looks as though it has been twisted, became in reality a "twisted" drill, and a new idea was born.

The twist drill is a spiral cut by a milling machine from a round bar of steel, with two, three or four flutes. When drilling the point cuts the material away from the bottom of the hole and the spiral elevates it and keeps the chips from packing and heating the drill unduly.

In making ordinary twist drills considerable steel in the form of chips is removed by the milling machine. These chips are generally sold for scrap and have comparatively little value. In making such drills of high-speed steel this loss is increased. In the process of making the twisted drill, the high-speed steel is rolled or forged to the proper section. The drill is either made flat or with two, three or four flutes, and when the twist is given, the fiber of the steel following the angle of the flute is retained without being interrupted. When removing surface irregularities and giving a finish to the drill, the loss of steel is negligible because only a small portion must be removed by grinding.

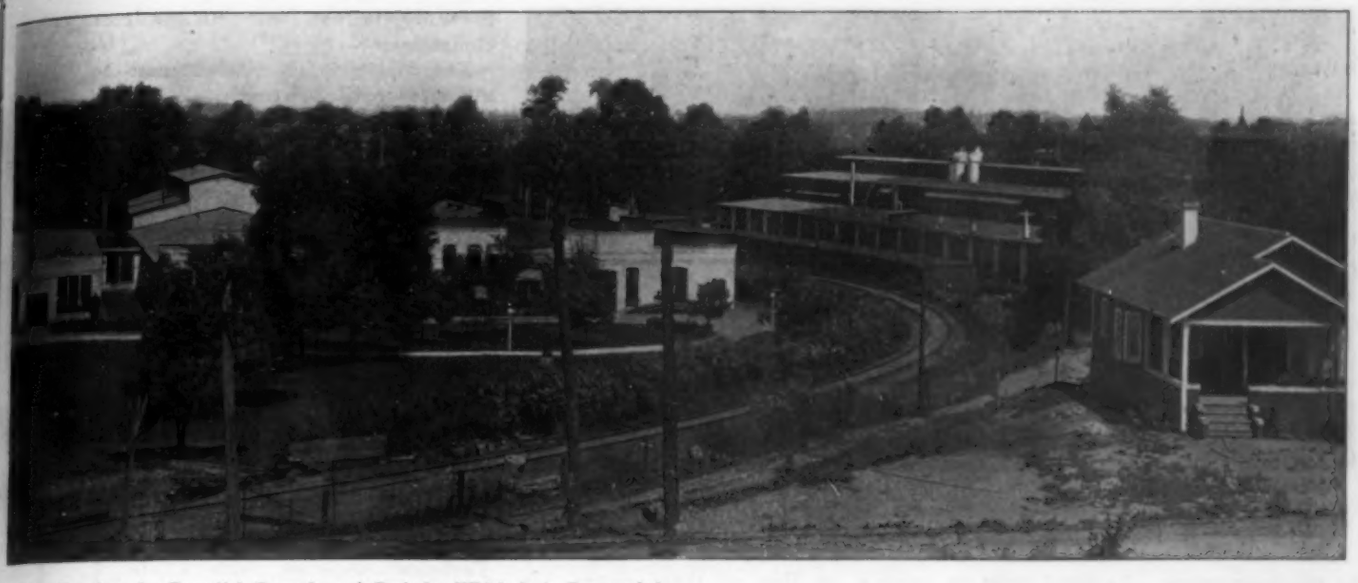
This process of making twisted drills was developed by the Clark Equipment Co., Buchanan, Mich., successor to the Celfor Tool Co. The latter company started in 1904 to make a flat, beaded drill for drilling bolt holes in steel rails and for use in shallow plate work. A chuck was also devised to give quick adjustment and to regulate the penetration of the drill into the material.

When the drills are operated in gangs of three or more, one of the drills often becomes shorter than the others. This requires more time to complete the triple penetration. However, by adjusting the chuck which holds the short drill in place, the tip of the latter is brought to the same level as the other drills.

THE GRINDING AND BUFFING DEPARTMENT IS LOCATED IN THE EAST WING OF THE MACHINE SHOPS

Development of the Drill

The flat drill, when used for deep boring, became a source of trouble due to jamming. This led to the introduction of the twist drill which has been used ever since for that class of work, the tailings being extracted by means of the flutes. The next development was the making of a concave drill. Here the flutes are formed by forging instead of milling, giving great strength, conserving material and making the steel denser. The piece is forged straight, reheated and the twist finally given through the medium of a me-



Mich., Showing the Beautiful Grounds and Park by Which it is Surrounded

Drills by the Hammered Method

chanism devised for that purpose. Later, drills with three and four flutes, made from high-speed steel rolled to the proper section, cut to length, heated and twisted, were added.

The processes through which the twisted drill passes are many and present several points of interest. The steel is heated no less than four times and annealed three times.

The flat or fluted section first is heated and cut to the proper length. For the concave drill the bit then is heated to forging temperature and forged in a helve hammer. Then the bits are set in the shank, which is slotted to receive the flutes, and heated in a brazing furnace. In the case of small drills the bit is electrically welded to a similar section of nickel steel and then forged.

Finishing and Testing

The small drill blanks are heated and twisted, the machine being operated by a hand gear; for larger sizes by a power gear. The mechanism for giving the flutes their spiral is composed of a series of superposed disks, each carrying in its center a die to correspond to the section of the drill. The blank is placed in these dies and gears are turned. The bottom disk is stationary and holds the tip of the blank while each successive disk above the bottom is rotated in turn by the gears through a certain number of degrees to a stop, the next disk then engaging and doing its prescribed rotation. By this means the exact contour of the spiral may be formed. The face of each die is relieved sufficiently to allow for the curvature of the spiral. After being twisted the drill is drawn from the dies and the gears reversed to set the disks for the next operation. Finishing operations include grinding the drill to exact diameter, buffing the spiral to give a finish, relieving the edge of the flute on a grinder and pointing. The tang is formed by milling the drills in gangs after which it is hardened by heating and cooling in oil.

One of the most interesting features of the tests to which the drills are subjected is the shock test. Although this test is almost primitive in its nature, it is said to be reliable in detecting even the smallest flaw. The drills are thrown with force against a cast steel block embedded in the floor from which they rebound, sometimes as high as a man's head. The ring resulting from the impact gives proof of the soundness of the steel and the presence of a check or flaw even of microscopic proportions is said to cause the steel to break like glass.

Chemical and microscopical tests are made of the material as received, and occasionally, while it is in the process of melting.

The Clark Equipment Co. has three principal departments. One is devoted

WEST WING OF MACHINE SHOPS SHOWING THE DRILLING AND SLOTTING MACHINES

VIEW IN THE FORGING DEPARTMENT SHOWING THE HEATING FURNACES AND HELVE HAMMERS

to the manufacture of twisted drills as described previously, another to the manufacture of cast-steel truck wheels and the third to the manufacture of rear axles for automobiles and trucks. A panoramic view of the plant and adjoining grounds is shown at the top of the preceding pages.

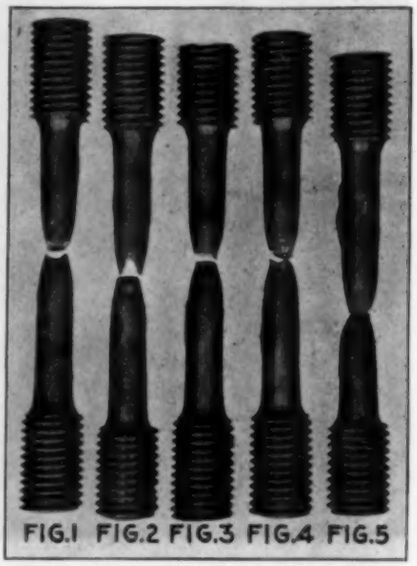
Form Highway Association

Each national association, representing an industry embracing the use or construction of highways has named a representative on the board of directors of the Highway Industries association recently organized. At a recent meeting in Washington, the following were nominated: A. N. Johnson, Portland Cement association; W. P. Blair, National Paving Brick association; A. P. Sandles, National Crushed Stone association; W. O. Rutherford, Motor and Accessory Manufacturing association; W., T. White, motor truck division of the National Automobile chamber of commerce; W. E. Metzger, motor car division of the last named body; E. G. Sutton, National Association of Sand and Gravel Producers; H. J. Long, National Slag association; E. J. Morrison, National Association Asphalt Block Manufacturers, and S. G. Beatty, National Association Road Machinery Manufacturers. The first five likewise serve as directors of the executive committee, with the association's officers as follows: S. M. Williams, president; A. R. Hirst, first vice president and E. J. Mehren and S. T. Henry, second vice presidents.

Effects of Arc Welding

The effect of electric welding upon iron or steel was tested recently. Five standard test pieces, ½-inch in diameter, were prepared. An arc was struck on four of these pieces. In some cases the arc was merely struck and in other cases the arc was struck and carried along the test piece for a distance of 1 inch. During this operation, no material was deposited from the electrode. The piece on which the arc was not struck was tested with the others. The welding current was approximately 60 volts and 150 amperes. The tests were conducted in the Westinghouse works at East Pittsburgh, Pa.

The accompanying illustration shows the specimens after they had been subjected to a pulling test. Figs. 1, 2, 3 and 4 show the pieces on which the arc was struck while Fig. 5 shows the one which was not disturbed in any way. The bar shown in Fig. 1 had a tensile strength of 49,200 pounds with 43 per cent elongation; Fig. 2, 49,100 pounds with 41.7 per cent elongation; Fig. 3, 48,600 pounds with 44 per cent elongation, and Fig. 5, 49,350 pounds with 40 per cent elongation.



THE PIECES AFTER TESTING

The investigation showed that the ultimate tensile strength of all five pieces checked closely. The piece which was not disturbed by the arc had a lower percentage of elongation than the other pieces. The test showed that the material on which the arc was struck underwent no structural change which would injure its original physical properties.

Co-ordinating Engineers

A meeting of representatives from every society and local section of national engineering societies in the state of Ohio was held in Columbus recently. This meeting resulted in forming the Association of Ohio Technical societies, with Clyde T. Morris, Ohio State university, as president and C. E. Drayer, Cleveland, secretary. Resolutions were adopted suggesting to the national engineering societies that membership in a local engineering organization should be a prerequisite to membership in the national societies, and urging local bodies to have at least one engineer named on any board having to do with expenditure of public funds where engineering experience would be of service. All delegates expressed the feeling that the practice of the profession must be regulated by engineers.

Norway Extends Electric Steel Manufacture

Commercial Attache Erwin W. W. Thompson, Copenhagen, Denmark, reports that transportation difficulties have greatly curtailed Norway's imports of iron and steel of various kinds. In normal times these imports aggregate 350,000 tons annually. In 1914, 1915 and 1916 the total tonnages imported were 243,733, 333,535 and 264,967, respectively, subdivided as follows:

	1914	1915	1916
Pig iron	32,254	33,208	34,761
Steel	2,638	1,697	2,230
Bars, rods, etc.	44,951	62,999	60,269
Heavy plates	41,124	70,829	55,375
Thin plates	34,021	41,710	29,267
Bolts, etc.	21,834	32,337	16,710
Beams and shapes	30,496	48,296	29,462
Tubes	18,896	22,030	22,187
Wire	17,519	20,429	14,706
Total	243,733	333,535	264,967

Since Norway's iron ore mines are so extensive, considerable attention is being paid to their exploitation as well as to the use of electric smelting because of the large amounts of available water power. No less than five new companies, according to Mr. Thompson, contemplate the working

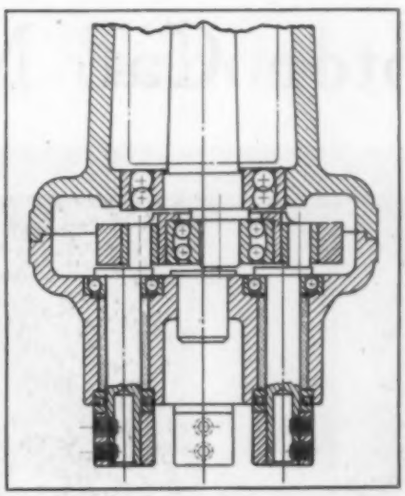
of iron and steel in various ways. While the Christiania Staalverk was originally capitalized 30 years ago at $8000, it is now the largest concern of its kind in Norway. It is planned to increase its present capital stock of $268,000 to $6,000,000 when its anual capacity for making steel and rolling plates and shapes will be 50,000 tons. This extension will receive encouragement from the government which offers to guarantee a loan of $2,742,000 to be repaid in 40 years. The government will also grant a subsidy of $1.61 per metric ton of rolled products turned out in the first five years' operations, as well as certain waterpower concessions. This will mean the development of power of the waterfalls, located about 18 miles from Christiania.

Plan to Build Coke Plant in Northern Mexico

It is probable that the southwestern portion of the United States at least may obtain a big part of its fuel supply in the near future from the extensive bituminous coal deposit situated near Ortiz, State of Sonora, Mexico. This coal is a semi-anthracite grade and is said to be the best quality yet found in Mexico. The development of the mines was begun several years ago, and for some time prior to the beginning of the revolutionary period, the output of the property was distributed over a wide area of Western Mexico. It is announced that E. P. Spalding of New York and associates have just purchased these semi-anthracite coal mines from the Carlos F. Johnson Coal Mining & Development Co. for a consideration of $3,000,000 to be paid in five years. The new owners plan to make extensive improvements which will include the installation of machinery, the opening up of new shafts and the construction of a spur railroad track to a connection with the Nogales-Guaymas branch of the Southern Pacific, a distance of four miles. It is stated that this coal is not only of a grade specially adapted for all kinds of fuel purposes, but that it produces a high quality of coke which will be used for smelting.

New Type of Drill Head

A crank method of driving multiple spindle drill heads has been adopted by the Heinkel Machine Tool Co., Sandusky, O. Two views of its adjustable 4-spindle drill head are shown. This drill head may be adjusted while the machine is in operation, thus facilitating the location of drills in jig bushings. Another



CROSS SECTION OF DRILL HEAD

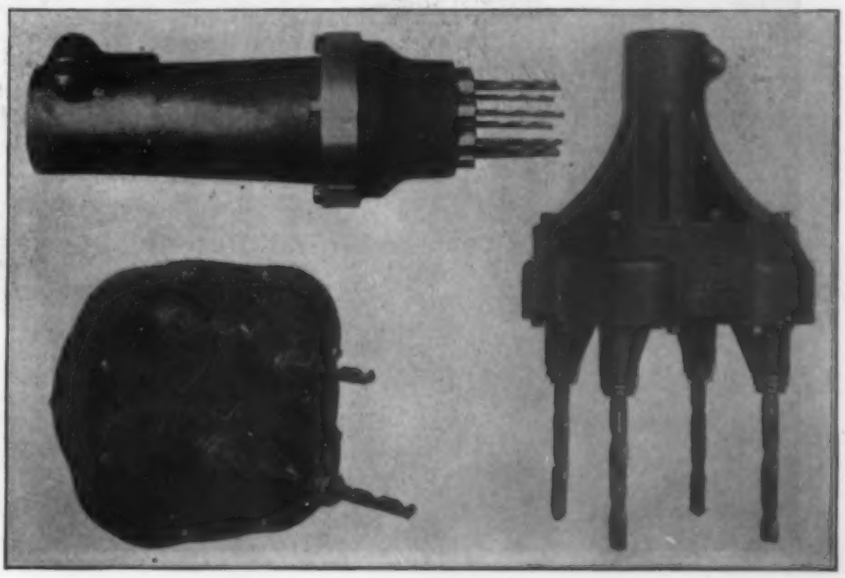
feature of the head is the elimination of overhang on one side of the drill press spindle as the method of adjustment allows the movement of the head in a circle. Adjustment in this manner keeps the drills equally balanced across the center line of the drill press spindle.

An 8-spindle drill head of the fixed type is also illustrated. This head is used for quantity production on certain pieces of work. A cross section which is reproduced on this page illustrates the design and construction of the fixed center type. The head is fastened to the sleeve of the drill press by a clamp screw and is held from slipping upward when under drilling strain by a stop which abuts against the bottom of the drill press rack. An annular ball bearing is mounted on the taper shank and thus gives extra support to the head and the drill press spindle. Power is transmitted by means of a crank on the lower end of the taper shank. This crank also has an annular ball bearing mounted on it, which is set into the driving plate. The driving plate oscillates when the taper shank revolves. The crank spindles fit into steel bushings in the driving plate and are rotated by the oscillating motion of the driving plate. A ball thrust bearing is mounted on each spindle and held in position by a nut. A floating steel plug is fitted which may be used to drive the taper shank into the drill press spindle.

Consider Roll Economy

British steelmakers, face to face with the necessity of reducing costs and increasing efficiency if they are to compete successfully for the world's steel trade after the war, are considering eliminating the multiplicity of rolls evil. A committee of the Iron and Steel institute has proposed, among other things, that there be a central committee to which all orders be sent. This central body, in turn, would allocate the orders among the various mills. It is pointed out that many mills now have rolls for practically all of the standard British sections, entailing the investment of thousands of dollars. But with a central board mills could be kept at the same kind of work for long periods, thus reducing the amount of roll changing and, hence, the cost of production.

The W. W. Sly Mfg. Co., Cleveland, manufacturer of foundry equipment of all kinds, is revising its catalog files and desires new catalogs, covering principally engineering subjects and equipment of various kinds.



MULTIPLE SPINDLE GEARLESS DRILL HEADS

Detroit Motor Car Manufacturer

Women Master Machinery Operations Almost as Quickly as the Finer Inspection Processes

Has Training School For Women

WOMEN, in increasingly greater numbers, are training to take the places of the skilled male mechanics who are entering the service of the nation. The interior views of a leading Detroit motor car plant which are reproduced on these pages show a few of the many production details in which women are acquiring marked proficiency. This company conducts a training school where women are instructed in the principles of shop practice. Views of the class in upholstery are shown at the upper left and at the bottom of the page. Instruction is also given for the purpose of minimizing accidents. The "safety first" photograph at the upper right is used by the company to emphasize the necessity for care in machine operation and to encourage the use of adequate protective devices on machines.

Combating Low Phos Iron Shortage

Government Employs Vigorous Methods to Deal with Scarcity of Raw Material for War Essentials—Provides Ore for Immediate Smelting and Commandeers Coke for Certain Furnaces—Various Expedients Proposed

WASHINGTON, March 2.—Energetic efforts being made by the government to increase the supplies of raw material for the tremendous requirements of and steel castings for war purposes, continue to accentuate the serious character of this problem. The latest developments that have been brought forth by this situation relate to the vigorous attempts being made to increase the supply of low phosphorus pig iron. This grade of iron is indispensable to the meeting of the severe specifications which various war departments, especially that of the ordnance division, insist shall be observed to the hair-line limit. The ordnance department's standards provide that the phosphorus of the casting shall not exceed 0.05 per cent. Recently the government ordered to be made up at the plant of the Eastern Steel Co., Pottstown, Pa., a quantity of low phosphorus ore which was in stock in the east. About 20,000 tons of iron are expected to be realized from this operation. Subsequently 15,000 tons of additional low phosphorus ore were obtained in Cuba by those in charge of pig iron distribution at Washington. This is to be brought in and converted in a similar way. To supplement this action the fuel administration, at the request of the war industries board, has commandeered coke from the Pottstown, Pa., furnaces which will smelt the low phosphorus ore. It also has ordered that 100 per cent shipments be forwarded against contracts by coke producers to other furnaces which are regular makers of this grade of iron, even though the fuel must be taken away from steel works and blast furnaces and the operations of the latter be curtailed accordingly. It is expected that these aggressive measures of the government to increase the supply of low phosphorus iron will be continued. Further furnaces are to be put on its production. One Ohio plant now is preparing to change its mixture from bessemer to low phosphorus.

Problem One of Ore

The low phosphorus problem, it is pointed out by those who are best informed on this subject, is one of ore. The developed domestic supplies are limited and considerable tonnage always has been imported, particularly from Spain and Cuba. Ordinarily these supplies would be sufficient to fill the normal requirements of the country but the war demands have expanded these needs tremendously and the situation has been reduced simply to one where the requisite supply of ore or iron is not available. There has been some agitation in favor of the intensive development of some ore deposits in the Superior regions, which while low in phosphorus, also are lean in iron content thereby adding considerably to the cost of their mining.

The furnaces which have been producing low phosphorus iron include those of the Northern Ore Co., at Standish and Port Henry, N. Y.; the Delaware River Steel Co., at Chester, Pa.; the Robesonia Iron Co., Robesonia, Pa.; the Bethlehem Steel Co., at Lebanon, Pa.; the Stewart Iron Co., Sharon, Pa.; the Cranberry Furnace Co., Cranberry, Tenn.; and the Thomas Furnace Co., Milwaukee. These producers combined have been turning out about 500,000 tons of iron per year. This includes both the copper-free and the copper-bearing iron. Beaurocratic redtape and the apparently temperamental inability especially of the war department to make any readjustments of its prewar standards in order to cope with an entirely new set of conditions, are charged with greatly aggravating the present situation. It is appreciated these are probably various classes of service which require the most exact limitation of the phosphorus content in castings. Furthermore, it is pointed out there are unquestionably other indispensable uses of low phosphorus iron by the government which have been rendered vitally important and of increased magnitude by the war. These relate to certain gun parts, special cables, etc. These absolute essentials, it is contended, make all the more imperative the conservation of the limited output of low phosphorus pig iron, especially of the finer quality most needed for the more exacting uses. This view is being impressed more and more strongly upon government officials by iron producers, steel foundrymen and other manufacturers who are directly concerned with the problem. So far it has accomplished little results. That the practical aspects of the situation operating upon those in the government war machine responsible for production, gradually will force remedial measures, however, is confidently believed by those who are in close touch with the situation. In the end, it is thought the government experts who are clinging to theoretical and minutely-drawn standards applicable without great advantage to pre-war demands but incongrously and seriously out of gear with the critical requirements of warfare on a big scale, will be brought to modify their views.

Substitutes Are Proposed

Substitution of acid steel castings by castings made by other processes, especially of the lighter character, by rolled and forged steel products and by other material wherever the physical requirements can be met, are being urged with increasing force in order that the intense pressure upon the low phosphorus iron supply may be eased.

American Gear Manufacturers to Convene

The second annual convention of the American Gear Manufacturers' association will be held at Green Brier hotel, White Springs, W. Va., on April 18, 19 and 20. The session will open with an address by F. W. Sinram, president. Following this address, C. R. Poole, representing the United States Chamber of Commerce, will read a paper on "Hardening and Heat Treating of Gears". Other papers which will be presented are as follows: "Uniform Cost Accounting", by J. W. Dunn; "Hobs and Hobbing Machines", by a representative of the Barber-Coleman Co. A report of the standardization committee will also be presented.

Iron Ore Booklet

Oglebay, Norton & Co., Cleveland, are distributing a 48-page booklet giving analyses of the various grades of iron ore which they handle. These ores are produced in a number of mines on the Gogebic, Menominee Mesabi and Cuyuna ranges, and from the Sudbury district of Canada. Sieve tests are given for a number of coarse Mesabi ores.

Obituaries

WILLIAM Parmelee Murray, member of the firm of Pickands, Mather & Co., Cleveland, died at his home in that city, Feb. 27, after an illness extending over a period of almost two years. He was born at Mentor, O., July 12, 1854, where his father, Robert Murray II, was a cattle dealer from 1830 until 1863. William Parmelee Muray, at the time of his death owned a stock farm of 600 acres there for breeding trotting horses. He received

WILLIAM PARMELEE MURRAY

his early education at the Mentor high school and his early occupation was as bank clerk with E. B. Hale & Co., Cleveland, commencing as office boy in 1870 and remaining until 1873 when he became assistant teller of the Merchants National bank. He left this position April 1, 1881, to learn the iron, ore and coal business and commenced making pig iron at Steubenville, O., for the Cleveland Furnace Co. In 1883 he became affiliated with the Tod-Stambaugh Co., and went on the road selling pig iron, remaining with them five years, when he established the coal department of Pickands, Mather & Co, later being admitted to the partnership.

Thomas F. Noon, president of the Illinoit Zinc Co., Peru, Ill., died March 2, at Phoenix, Ariz.

John G. Sheidel, manufacturer of hoisting machinery, died recently at his home in Reading, Pa., aged 62 years.

Thomas Kendrick, one of the founders and part owner of the Kendrick Valve & Washer Co., Syracuse, N. Y., died suddenly in St. Luke's hospital, Jacksonville, Fla., Feb. 25. He was born in Cambridge, Mass., 66 years ago, but had lived in Syracuse practically all his life. He left for a short vacation about two weeks ago in good health.

William Robert Sterling, a partner in the firm of Peabody, Houghteling & Co., died March 3 at his home in Chicago, aged 66 years. He was born in Scotland and before becoming affiliated with Peabody, Houghteling & Co. he was vice president of the Illinois Steel Co., previous to that being connected with the Joliet Steel Co.

Harry Smith Morrow, well known hydraulic engineer, died at his home in New York City, March 4. Some of the engineering feats with which he has beep identified are the Whitney, N. C., dam and waterworks, the New York state barge canal and the pipe line which brings the water supply to New York City 900 feet under the Hudson river from Storm mountain.

Charles A. Borst, mine owner, Clinton, N. Y., and head of the Clinton Hematite Co., died suddenly at his office a short time ago. He was born in Schoharie county in 1851 and was graduated from Hamilton college in 1881. About 15 years ago he became interested in the low grade hematite ore in the vicinity of Clinton. Later developments in the process of making iron with ores of higher grades especially for use in the bessemer process, enabled him to extend his operations considerably.

Irving McC. Bean, who was assistant manager of the Northwestern Iron Co. plants, at Mayville, Wis., and Milwaukee, and president of the Milwaukee Boiler Works, died recently after an attack of pneumonia, at the age of 43. He was a graduate of the universities of Wisconsin and Michigan and a son of the late Captain Irving McC. Bean, one time owner of the Northwestern Iron Co. and president of the Spring Lake Iron Co., which had a furnace at Fruitport, Mich.

William D. Dunning, 81 years old, a well known manufacturer and foundryman of New York state, died recently at his home in Syracuse, after several weeks' illness. He was born in Whitesboro, N. Y., Feb. 11, 1837, and as a young man was employed in 1862 in the state engineer's office at Albany. He then took up a position in the state engineer's office at Syracuse, where he remained until 1870, when he entered the firm of Alexander, Bradley & Dunning. The latter operated an iron foundry and

WILLIAM D. DUNNING

machine shop on the site occupied now by the Alexander Iron Works, which Mr. Dunning carried on after the death of his partners. He was also secretary and treasurer and large stockholder of the Boomer & Boschert Press Co., and was a director of the Onondaga County Savings bank.

William Burnham, who was chairman of the board of directors of the Standard Steel Works Co., Burnham, Pa., and a director of the Baldwin Locomotive Works, Philadelphia, died recently in that city, following an operation. He was 72 years old and entered the Baldwin works on leaving Lawrence Scientific school, Cambridge, Mass. In 1871 he became assignee for William Butcher, maker of the first steel locomotive tires in the United States, and was made secretary and treasurer, when the Standard Steel Works Co. was formed.

Great Ford Plant is Taking Form

Shipyard for Submarine Chasers Will Be Completed Speedily as First Unit of Group—Two Blast Furnaces to be Ready Next Year—Special Metallurgical Process to be Followed in Steelmaking

DETROIT, MICH., March 4.—Steel work, following a year's operations in the laying of foundations, is beginning to appear on the 4000-acre site of the Ford Motor Co.'s blast furnace, steelworks, by-product coke, shipbuilding tractor and rubber plants on the River Rouge, just outside the westerly city limits of Detroit. A vast amount of temporary construction work has been done on the property. The first permanent construction now is nearing completion in the form of an ore unloader, being installed by the Wellman-Seaver Morgan Co. Materials for another unloader are on the grounds awaiting assembly. The project eventually will represent an investment of $14,000,000.

Up to this spring, work on the site of the four blast furnaces has been devoted to the sinking of thousands of piles as foundations for the ore and coal storage yards and dykes forming the walls of what will be a 2600-foot canal, 20 feet deep and 110 feet wide. The canal will run through the center of the entire property, dividing the blast furnace and shipyard sites from the tractor plant. The canal now is taking form and the waters of Roulo creek will be diverted into it, emptying into the River Rouge a mile from that stream's junction with the Detroit river. It is on the east bank of the canal that the ore unloaders are being erected and the foundation for the ore storage yards is being laid. There are 6000 men now at work on the construction of the blast furnace facilities and the shipyard. In the latter will be turned out submarine chasers for the navy department.

Provide for Water Navigation

An indication of the engineering problems that are being solved in preparing the site is given in the fact that River Rouge and Roulo creek will be diverted into new channels. The creek, now a winding, shallow stream, will be converted into a straight canal with concrete embankments. The River Rouge is being deepened and straightened in its course to permit its navigation by lake freighters drawing 20 feet of water.

The turning basin for lake freighters will be constructed under government supervision at the junction of River Rouge and Roulo creek canal. This area, forming a semicircular bay will be dredged and widened until it has a depth of 25 feet and an area of 989,100 square feet. The turning basin and canal will be dredged within the next 30 days and entirely completed this year. Incoming steamers will turn in the basin and back up the canal for unloading by two 12-ton scoops. The turning basis is being dredged by the Duluth-Superior Dredging Co. at the rate of 500 yards per hour. The mud taken from the basin is being distributed for filling purposes over the property by air pressure through steel pipes.

The steel plant will cover 350 acres and will have seven buildings, four blast furnaces and four storage yards. It is planned to have two of these furnaces in operation in 1919. All four will be in operation by 1920. The administration building, on the east side of the property, will be 175 x 175 feet; the laboratory also 175 x 175; the by-product plant 1000 x 1000; the powerhouse 300 x 440; the machine shop 1000 x 200; the foundry 275 x 1000, and the cleaning shop 1000 x 100. The storage yards, two for ore and two for coal, will be 500 feet wide and 1530 deep. These will extend along practically the entire length of the canal.

Special metallurgical processes which will give the Ford company greater flexibility in the grades of steel produced are to be carried out in the blast furnaces and steel works. The ore, it is said, will receive some new character of treatment in the smelting operation and the final reactions will take place in the open-hearth furnaces. It is declared that the process to be pursued in steelmaking is of a secret character and only general statements regarding it now are being made public.

The layout of the plant provides that the ore will be handled by cars from the docks into the storage yard or to the furnaces. The direct furnace ore will be delivered to a bin system which will serve the skip hoists. The iron will be tapped in molten form to the ladles and transferred to the open-hearth furnaces nearby. From the open-hearth plant the metal will be conveyed to the foundry. After molding, the castings will be taken by conveyor to the cleaning department and then passed on to the machine shop.

The by-product coke plant will be operated and owned by the Semet-Solvay Co. The Ford company has entered into an agreement with the Solvay interests whereby they are to occupy a part of the blast furnace property, and in turn produce for the Ford industries. All the by-products will be taken out by the Solvay company during the reduction process, and the plant will furnish the Ford property with gas.

Concrete Work Very Extensive

Millions of barrels of cement will be used in the construction of the ore and coal storage docks and yards. Already much reinforced concrete foundation work has been completed. Boats are bringing in 700 cubic yards of gravel daily for this cement work. The first ore yard soon will be completed adjoining the ore unloader. To carry the millions of tons of ore, piles were driven four feet apart over the entire area. On top of these will be placed two feet of reinforced concrete flooring. The yards are divided into two sections which distribute the ore load equally. The retaining walls are of reinforced concrete, the first one, on the canal side, being 17 feet high and supporting the ore unloader. The middle wall is 20 feet high and the third 40 feet.

Concrete mixing for this work is being done through a new process which forces the concrete in liquid form through 6-inch pipes under 80 pounds of air pressure to the section on which the concrete is being poured. It is also carried 50 feet up to the top of the forms for the retaining walls.

Officials in charge of the project, which is the largest industrial improvement of its kind ever attempted in the state of Michigan, include W. B. Mayo, chief engineer of the Ford Motor Co.; G. R. Thompson, construction superintendent; J. W. Gray, resident engineer for Julian Kennedy, noted Pittsburgh blast furnace builder; H. J. Lamet, building inspector for the Ford Motor Co. and expert dyke builder, J. W. McClain,

head of the receiving department and George A. Brown, auditor.

Coking Coal

Developments Advancing in Eastern Kentucky—Steel Corporation Active

(*Special Correspondence.*)

Whitesburg, Ky., March 1.—The most important coal deal consummated in Kentucky in several years was closed a few days ago for 125,000 acres lying in Perry, Leslie and Clay counties below Whitesburg. The Peabody-Hoteling Co., Boston, Mass.; Williams & Peters; The Semet-Solvay Co. and others of Charleston, W. Va., for the development of 400 acres of Caudill's Branch coal lands several miles below here involving large expenditures. A six-mile branch of the Louisville & Nashville is being extended into the Caudill's Branch section. The Middle West Coal Co., the Rockhouse Coal Co. and the Turkey Foot Coal Co. are new corporations developing in that section. The Middle West Coal Co. is composed of Toledo and Cincinnati interests and will be the largest in that section. The Kentucky Block Coal Co. is a new company just organized by West Virginia and Ohio capitalists at Virgie, east of here, on the Baltimore & Ohio railroad, where 2000 acres have been leased from the Solvay Co., Boston, for immediate development. A new town will be established. The United States Coal & Coke Co., a subsidiary of the United States Steel Corporation, developing 20,000 acres in the Looney Creek section, in Harlan county south of this city, is making shipments of 20 cars daily, and has its plant only partially developed. It is planned to be mining 10,000 tons daily within three months. Within a few months the new city of Lynch, modeled after Gary, Ind., will house about 8000 to 10,000 people. The coal is being shipped to Gary, South Chicago and Joliet, for coking.

The Virginia Iron, Coal & Coke Co has leased several thousand acres of coal lands lying along Carr's Fork, below here, where development has commenced by the Carr's Fork Coal Co. At least six coal operations are going on in that section. The Louisville & Nashville railroad is building an extension up Carr's Fork to reach the new developments. The whole of eastern Kentucky soon will be under way of development by large corporations.

ers of New York, were the purchasers. The Middle Fork railroad, 50 miles long, will be built in order to develop the properties. Several new industrial towns will be constructed along the route of the railroad extension. The coal to be developed in the territory is of gas and by-product quality.

Philadelphia and Detroit men, including C. C. Winters, A. L. Mancourt, A. F. Weist, D. C. Anderson and J. B. Altemus who recently organized The Elkhorn Collieries Co. to develop 6000 acres of coal lands on Thornton Creek in Letcher county have started initial development work. A five-foot vein of cannel coal and a seven-foot vein of steam, gas and by-product coal will be developed. Tests have shown that the coal is especially adapted for coking.

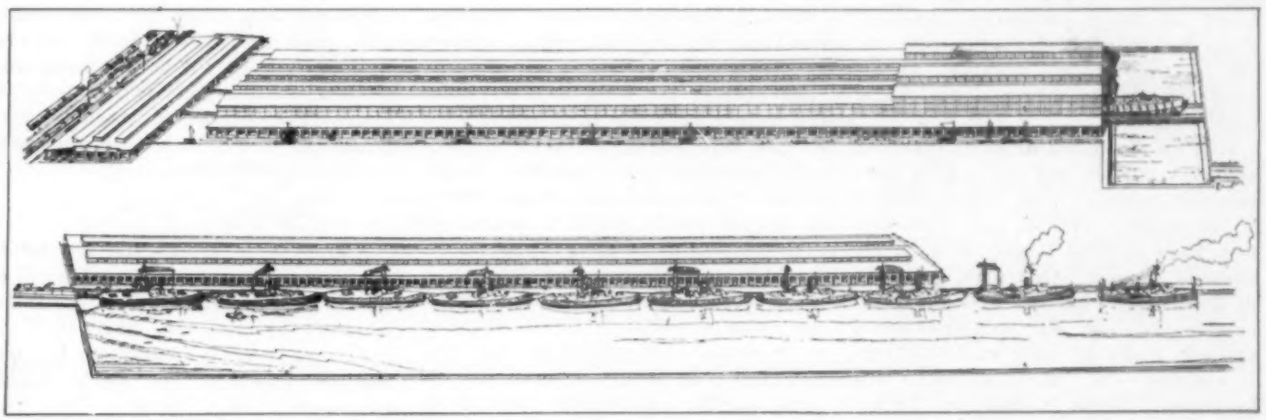
The Caudill's Branch Coal Co. has been organized by P. M. Clanahan and

Crucible Files Protest

Three supplementary affidavits have been filed in the United States district court at Pittsburgh by the Crucible Steel Co. of America, against the making of payments to the railroads for hauling slag. Recently Judge W. H. S. Thomson of the federal court decided that iron and steel manufacturers are liable for freight charges for the transportation of slag regardless of the manner of its disposal by the carriers. Since the railroads use a great quantity of slag the manufacturers claim no charge should be made for the hauling of slag when it is devoted to this purpose.

After considerable delay because of dearth of material, a second blast furnace has been added to the Penchihu Collier & Mining Co.'s equipment in Manchuria, which will increase the company's annual output to 100,000 tons of pig iron. Mining arrangements at Nanfen are being enlarged to meet the increased demands of these furnaces.

Ford Submarine Killer Plant Expected to Produce in 75 Days



THE drawing shows how the Ford Shipbuilding plant, now under construction at River Rouge, will look when completed. The drawing is in two sections, the lower one connecting at the right of the upper. Materials for the building of submarine killers will go into the fabricating shop, shown at the left of the upper section, and as put together will be carried on rails into the bays adjoining. Here as a hull gradually is assembled it will move through the bay until ready for launching, it reaches the transfer table, shown at the right of the upper section, and is dropped into the water. It then will pass through a slip to the position of the first boat shown at the dock in the lower view. Here equipment will be installed and the ship moves to the position in which the second boat appears. It will be moved up in turn to the positions indicated by the succeeding boats, and will be fitted out in consecutive operations. At the last place, wireless will be installed and the boat will be ready for its trip to the submarine zone. Crews of the boats will be trained on the scene and follow the construction of their craft through every stage, manning them when they are complete. The plant, which will cover five acres of land, north of the blast furnaces, will be completed and producing before May 10—75 days.

Discuss Remaking of War Board

Expansion of Present Body to Include Representatives of Army, Navy, Shipping Board and Other Leading Consuming War Branches is Proposed—Steel May Lose Individual Representation—More Authority is Promised

WASHINGTON, March 5.—Reorganzation of the war industries board is regarded as altogether likely whether either the Overman or the director of munitions bills passes congress. It is under discussion now and plans have been proposed to expand the board through the addition of some and the dropping of other divisions. The vacancy in the chairmanship of the board and the popular demand for a board of some authority, whether given by the President through one bill or another, are regarded as almost certain to bring about some readjustment.

Men on the board or in its divisions and men outside but still in the government realize that reorganization is necessary. What the President may have in mind largely is what his advisers suggest. One plan, broached to government officials and approved, in a measure, by war industries board officials, looks to more equitable representation of the various war branches. While it may not be accepted officially and finally, it is expected to have weight.

It has been suggested that the shipping board, the fuel and the railroad administrations, the war trade board, the allies and the steel and priorities divisions of the war industries board be given representation on the reorganized board and that raw materials, finished products and labor representations be regarded as divisions and not commissionerships. This would leave the army and navy sections of the present board intact except, possibly, for change in the representative personnel.

Suggest Dropping Steel Section

Such a plan, while regarded as meritorious and looking to full co-ordination, would make a board of nine, exclusive of the chairman, which would be unwieldy, according to some opinions. From this source it is suggested that steel and priorities be dropped along with labor and the raw materials and finished products sections. That would still leave a board of seven, eight with the chairman, which is large yet fully representative of consuming ends of the government.

Because of the demands for steel by the army, the navy, the allies, the railroads, the shipping board and neutral countries, and because of the demands of transportation of fuel, raw materials and finished products, it is felt all should have some representation in the board. What is true as to steel is true also of other war essentials, and for that reason it has been suggested steel be given no more preference than lumber or cotton or wool, etc., which leaves open only the course of making steel and the other raw and finished materials sections as divisions under the board.

At present the army and navy are the only consuming ends represented on the war board, Admiral Fletcher and General Pierce being the incumbents. Yet neither has had authority to decide which of the branches of their respective military departments would have preference over the other when there is a conflicting demand for some essential in which there is a shortage. Officers from the war and navy departments, even in the same section or division, have made similar demands on the directors under the board and as a result have caused much confusion which has led to halting and indecision. Each wants his needs supplied and no one had authority to give preference.

To Fix Priority of Essentials

For this reason it is felt that every army requirement or every navy or every shipping board demand should be made to the war industries board through one source, that source being a responsible officer with authority to determine which is the more essential of several demands. With the railroad administration to be a big buying factor, its representative necessarily would have two functions, that of presenting the railroads' needs and of assisting the other departments in their transportation difficulties. By this plan neutral requirements would be presented through the war trade board. The allies, instead of speaking through the present commission, which is composed of three of the six members of the board, would present their requirements through one representative. The fuel administration's representative also would be an authority, which representation would, if for no other reason, require submission of any such plan as the fuel conservation order of Jan. 17 before its promulgation.

Labor is taken from the board, in the proposed plan, because labor already has representation in the advisory board of the council of national defense, has ample play for its demands through the various labor channels already set up and in action here. Because it is a raw material entering into production of war essentials, could have representation under a division in the war industries board's various sections and directories. For this reason the raw materials and finished products sections also would be left off the board in its reorganization.

Chairman to be Supreme

Above these representatives would be the chairman with authority of the President, for the new chairman, whoever he may be, likely will be one with powers delegated by one law or another. He would decide questions arising between any two or more of the members of the board as to which department should have preference as to this tonnage of steel or that quantity of copper, etc. The subdivisions of the board would in reality be the administrative functionaries of the chairman which would include practically all of the present divisions. Each member of the board necessarily would have to have his own staff which largely would be the entire department from which he would come. The allies' representative, for example, would have a staff composed of a member from each of the war missions.

This plan is that on which the war trade board, the war council of the war department and the council of national defense, each in its own way, have been built up. At present the council of national defense with the shipping board, the food and fuel administrations and one or two other government branches have a get-together meeting once a week, but more for guidance of the leaders rather than decisions affecting specific questions.

The Norfolk & Western railroad seeks cancellation of pig iron rates out of Bristol, Va.

Exports Slump to Nations Nearby Germany

Washington, March 2.—American imports so far have not been affected by the proclamations of the President but exports are beginning to show curtailment. Available figures present an increase of $7,000,000 in import trade for January over December and a decline of over $80,000,000 in exports in the same period.

The value of all imports to the United States in the seven months ending with January, the total for the month being $235,000,000, was $1,634,000,000, an increase of nearly $300,000,000 over the same months in 1917. Exports, which in the first month this year fell to $504,000,000, had a total value of $3,448,000,000 in the seven months' period compared with $3,616,000,000 last year. Gold imports in January, $3,746,000, were less than the exports by nearly $700,000. The seven months imports and exports of gold were, respectively, $78,694,000 and $41,186,000. Silver imports were $5,997,455 in January and $41,186,000 in the seven months while exports were $6,628,000 and $52,032,000, respectively.

South America, Japan and Mexico in January show an increase in commodities received from the United States, while Russia, since the revolution, and neutral countries, since the promulgation of the licensing system, show sharp declines. Exports of all kinds to Sweden fell from $5,564,171 in January, 1917, to $4,392 in January, 1918; similarly exports to Holland declined from $14,776,742 to $479,476; to Denmark from $5,475,516 to $405,376; to Russia from $51,547,000 to $2,996,000.

The foreign trade carried on by the United States and Russia last year amounted to $438,000,000, a decline of $39,000,000 which is considered remarkable in the face of the unsettled conditions. The decrease in the total volume is believed due to the congestion and port restrictions at Vladivostok, as loss occurred only in the trade with Siberian Russia. The increase in trade with European Russia was $14,000,000 over the total of $313,000,000 in the year before. This gives a decline of $53,000,000 in Siberian commerce. Deductions indicate the business sent to and taken from Siberia reached $111,000,000 last year as against $164,000,000 in 1916. Trade with Russia practically ceased early in December.

Capital Odds and Ends

BUSINESS firms which have found the regulations too general to fit specific cases are expected to welcome a board of excess profits reviewers soon to be created by Internal Revenue Commissioner Roper, to make rulings on specific questions in returns. Upon the board's decisions will depend many millions of dollars in taxes.

* * *

Increase from 15 to 16 cents per 100 pounds in the carload commodity rate on tinplate and terneplate from Cincinnati to Nashville, Tenn., has been asked.

* * *

Cancellation of rates on iron pyrites is asked by the Chicago, St. Paul, Minneapolis & Omaha railroad on shipments from Washburn, Wis., and Ashland, Wis., to Barkdale, Wis.

* * *

Cancelling a tariff providing for a rate of $1.50 per ton on pig iron in carload from Chicago to Alton, East St. Louis, Granite City and Madison, Ill., asked by the Pennsylvania lines will leave a rate of $1.50 in effect.

* * *

Increases in minimum carload weights on sulphuric acid and ores and concentrates and cancellation of rates on pig iron and copper bars and plates are asked by the Atchison, Topeka & Santa Fe railroad.

* * *

Railroads have asked an increase of 1.8 cents per 100 pounds on the rates on machinery, including steam pumps and air compressors, from Quincy, Ill., to gulf ports when consigned to Porto Rico.

* * *

The Atchison, Topeka & Santa Fe railroad wants to cancel the carload rate of 64 cents per 100 pounds on iron and steel bars from Minnequa, Colo., to various New Mexico points; to substitute an increase rate of 4 cents on bars in carloads, and to increase the minimum carload weight on bars from 36,000 to 40,000 pounds.

* * *

Seattle station of the bureau of mines is conducting experimental work on Alaskan nickel and tin ores and expects soon to undertake work on chrome ores. Concentration will probably be so divided that the ore concentrates will be brought to the United States for treatment. The urgency efficiency bill now in congress grants a $75,000 appropriation which will enable the bureau to send to Alaska metallurgists and engineers to further investigate the mineral resources.

Foundry Meeting

Will be Held in Milwaukee in October—A. F. A. Takes Action

Milwaukee, one of the leading foundry centers of the United States, has been selected as the 1918 meeting place for the annual conventions of the American Foundrymen's association and the American Institute of Metals. Concurrent with these gatherings will be held the exhibition of foundry equipment and supplies, machine tools and accessories. On Monday, Oct. 7, the deliberations of the two foundrymen's technical societies will be opened with a joint session, and at the same time the visitors will be given their first opportunity to inspect the displays. The convention and the exhibition will continue throughout the week.

The meetings of the American Foundrymen's association and the exhibition will be held in the auditorium where ample display space will be afforded and a sufficient number of large meeting rooms are available for the joint sessions which will be scheduled for three days of the week.

The auditorium is one of the largest and most complete structures of its kind in the world. Machinery hall, where the operating exhibits will be assembled has a floor area of 54,000 square feet, and the arena, where the still exhibits will be located, has a floor area of 22,500 square feet. If necessary, the stage, 50 x 68 feet, also may be used for exhibition purposes. Two large meeting halls are located on the first and second floors.

Milwaukee is one of the largest foundry centers of the United States, and provisions will be made for plant visitation throughout convention week. Within the confines of the municipal limits of the city are located about 80 gray iron, steel, malleable iron and brass foundries, and including North and South Milwaukee and West Allis the total is in excess of 90. Racine, Wis., only a short distance from Milwaukee, is the center of approximately 20 foundries.

The committee of the American Foundrymen's association empowered to decide upon the time and place of the 1918 convention and exhibition, which met in Milwaukee several days last week consisted of the following: Benj. D. Fuller, president, Westinghouse Electric & Mfg. Co., Cleveland; C. E. Hoyt, exhibition manager, Chicago; H. R. Atwater, Cleveland Osborn Mfg. Co., Cleveland; S. T. Johnston, S. Obermayer Co., Chicago; V. E. Minich, Sand Mixing Machine Co., New York, and A. O. Backert, secretary-treasurer, Cleveland.

Scour Britain For Scrap

Shortage of Pig Iron Causes Demand For Old Castings—Works Combination Effected—Ferromanganese Advanced

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 26, 1918.

THE pig iron situation has not materially altered. At the meeting in Birmingham yesterday there was great pressure for supplies, nearly all the makers were declining new business while doling out in small parcels such iron as they had to offer. Almost every hour brings warning from some customer that a foundry or a mill is on the eve of stoppage. Usually, after this distress, the metal gets there in time to prevent a stoppage. Now that it is impossible to get adequate pig iron the country is being scoured for old castings, special agents being started on the road with this object, so that the pig iron deficiency may be made up by broken cast iron. There is practically no forward pig iron buying, the makers putting on their books orders for short periods, which they consider they can safely supply. The scarcity of metal in the Midlands has diverted a good deal of business to the Cleveland district, where some little surplus iron is to be had, mainly because the export trade is practically suspended through lack of tonnage, and the necessity, on account of the shipping difficulties, to restrict exports to the minimum. Demand for hematites is as keen as ever.

One of the best known sources of pig iron supply, the Frodingham Steel & Iron Co., Lincolnshire, figures prominently today in an amalgamation now announced. Messrs. Steel, Peech & Tozer, of Sheffield and Rotherham, in conjunction with Messrs. Samuel Fox & Co., of Stocksbridge, Sheffield, recently acquired the works of the Frodingham company and shortly afterwards amalgamated with the Workington Steel & Iron Co. It is now reported that they have purchased from the Steel Co. of Scotland their interest in the Appleby Iron Co., another Lincolnshire undertaking. The effect of these purchases will be to constitute another big iron and steel combination, which will be almost self-contained, since it includes companies who possess coal mines, iron ore fields and complete iron and steel making plant. The capital of the Appleby Iron Co. is £400,000 and the Steel Co. of Scotland provided one-half. The Appleby Iron Co. produces pig iron only. When the Steel Co. of Scotland acquired an interest in it some years ago, the intention was to add the manufacture of steel, but this has not yet been done. It is thoroughly recognized in the iron and steel trade that a new policy of enterprise is greatly needed for the increase of pig iron production. Even the man in the street now recognizes, after the fierce light thrown upon the subject by the war, the enormous importance of iron and steel production as a factor for promoting national safety.

Ferromanganese is Advanced

Ferromanganese has been advanced from £25 ($120) to £26 10s ($127.20) per ton and there is an enormous demand for this material. With regard to hematite, efforts to increase all supplies have met with a measure of success, so that there is on the whole a fairly hopeful outlook with regard to increased iron supplies in the future. Stacks are in course of erection in different parts of the country; but, with the scarcity of labor and the enormous difficulty in obtaining essential items of plant, progress is much slower than all parties desire. Undoubtedly, the comparative scarcity of coal places an obstacle in the way of production. All smelting is carried on under difficulties, through railway congestion and truck scarcity.

The iron masters of South Staffordshire have disposed of one formidable difficulty, in the settlement of the wages question. The ministry of munitions has placed no obstacle in the way of the program initiated by the Midland wages board, and the new scheme was set forth yesterday in connection with the bimonthly return issued by the board showing selling prices for November and December. This is issued a week later than usual, but its publication was delayed with the object of including the statement as to the 12½ per cent advance authorized by the ministry of munitions.

Workmen Receive Advance

As recently explained, the Midland wages board decided to pay to the day workers the 12½ per cent, when the men receive their wages tomorrow, and no doubt the settlement of this question will be plain sailing. The men will have a very substantial sum to play with, as the advance dates back to last October. The addition of the 12½ per cent to the tonnage men was a somewhat less simple matter, but after much negotiation the simple policy was adopted of adding this to the sliding scale payment. As there is an advance in selling prices sufficient to authorize 2½ per cent from Monday last, the puddlers and mill men will now get a solid advance of 15 per cent. This brings puddlers' wages up to 19s 6d ($4.68) by far the highest wage ever earned in the iron works.

Engineers to Give Study to Problems of War

The program for the spring meeting of the American Society of Mechanical Engineers, to be held at Worcester, Mass., June 4 to 7, has now been tentatively arranged by the committee on meetings and the Worcester local section's committee. As in the past two meetings, the program will be devoted almost exclusively to military matters or to subjects having a direct bearing on the war such as the textile industry, the shipbuilding industry, the manufacture of small arms and gun carriages. One of the most interesting features of the convention will be an all-day automobile excursion to the New England cantonment at Camp Devens and to the historical places at Concord and Lexington, which hold peculiar interest right now.

Members will register on Tuesday afternoon, June 4, at the Hotel Bancroft. The business sessions will be formally opened on Wednesday, June 5, with an address by Charles Washburn on the industries of Worcester. General sessions with technical papers will be held, these including one devoted to industrial safety and workmen's compensation. A general war session will be held in the evening on the general theme, "How Engineering Societies Can Assist in the Procurement Program of the Government." Some of the major topics to be discussed at the session are ordnance and ships for the navy department, munitions for the army, aircraft material, merchant ships, training of labor, etc.

On Thursday, June 6, general sessions with technical papers, including a fuel and public relations session, will be held. In the afternoon, members will adjourn to the plant of the Norton Co. for a general plant inspection. A dinner followed by an illustrated lecture will feature the evening's entertainment. Friday, June 7, the last day of the meeting, will be given over to the automobile excursion.

Exports Decline As Ban Tightens

Foreign Iron and Steel Shipments in January Slump All Along the Line—Net Loss 113,224 Tons Over January, 1917—Pig Iron Leads in Shrinkage —Downward Movement Expected to Continue

EXPORT figures in iron and steel compiled by the bureau of foreign and domestic commerce for January indicate in a striking manner a tightening of the nation's economic blockade of Germany. The precipitate decline of shipments of all kinds to neutral countries adjacent to Germany which took place in the initial month in a considerable measure was made up of iron and steel and their products. A small part of this decrease is attributed to the shortage of cargo space, as the allied tonnage is being devoted mainly to supplying the needs of France, England, Italy and of the American army overseas. Late figures evidence a decrease in total exports to England in January, 1917, but likewise indicate a great increase in shipments to France and Italy.

IRON AND STEEL EXPORTS, GROSS TONS

	January,		Seven months ending January,	
	1918	1917	1918	1917
Scrap	412	23,012	26,145	136,881
Pig iron....	20,581	69,146	298,752	526,982
Steel billets, ingots and blooms ..	195,385	183,656	1,180,304	1,089,961
Wire rods..	14,800	7,467	126,217	84,171
Steel rails...	35,824	76,493	252,073	376,190
Steel bars...	73,772	57,358	357,952	465,050
Iron bars...	5,399	5,171	31,012	39,135
Struc. iron and steel..	25,368	28,590	155,075	200,815
Hoops, bands and scroll.	4,283	4,753	36,319	25,973
Sh'ts & plates.	50,199	62,512	461,713	338,742
Tin and terne plate	19,958	23,408	124,835	127,957
Barbed wire	8,492	17,304	111,336	230,984
All oth. wire	13,591	17,735	110,985	155,819
Cut nails...	162	288	2,950	3,153
Wire nails..	8,071	7,224	76,248	85,193
All oth. nails incl. tacks.	990	1,637	9,101	9,942
Pipes & fit'gs.	14,463	17,013	117,730	159,385
R. R. spikes, bolts, nuts, rivets and washers ..	2,549	5,205	30,320	28,165
Horseshoes..	512	103	7,538	2,917
Cast radiators	246	206	2,080	1,624
Total	495,057	608,281	3,518,685	4,089,039

Iron and steel and their products led in the marked decline of shipments which is apparent in all commodities. Scarcely a single item appears in the list of iron and steel products that did not register a sharp decrease in January. Exports have been dwindling ever since restrictions have been placed on the shipment of certain products and this is expected to continue indefinitely. The month of January probably is only an indication of what may be expected in exports for February under the new licensing system restricting all exports. Total iron and steel exports in January were 495,057 tons compared with 608,281 tons in January, 1917, a loss of 113,224 tons.

Pig Iron Leads Decline

Pig iron lead the decline with the largest increment of decrease of any of the products on the iron and steel list. Foreign shipments of pig iron in January, 1918, were only 20,581 tons, as compared with 66,573 tons in December, 1917. These figures show a difference of 45,992 tons. This sets a record of shrinkage for all the products. The total tonnage of pig iron exports for the seven months' period ending January, 1918, was 298,752 tons against 526,982 tons in 1917. This low aggregate for the seven months' period is believed to have been occasioned more by the country's own war requirements, however, than by any governmental curtailment of shipments. Steel billets and blooms followed the general trend of all iron and steel exports, although to a less marked degree than in most of the other items. The aggregate tonnage exported in January, 1918, was 195,385, while that shipped abroad in the preceding month was 204,555 tons. Structural shapes also fell off in January, notwithstanding the great amount of construction work that is being done by the government in France. Further government work for France either definitely announced or planned, may materially raise the tonnage of this product exported in succeeding months. Foreign shipments of structural shapes amounted to only 25,368 tons in the first month of 1918 as contrasted with 34.567 tons in December, 1917. These figures show a decline of 9199 tons in one month. Steel rails were no exception to the prevailing tendency. Exports of rails were only 35,824 tons in January, 1918, as compared with shipments of 50,935 tons in the preceding month of 1917.

The unfavorable turn of events in Russia evidently has had considerable effect on the exportation of rails and other track material. Vast quantities of these products were sold for delivery in Russia, but with the coming of the new regime in that country, together with its reign of anarchy, these products were held in America, or reworked so as to be used for the allies. Exports of scrap were only 412 tons in January, 1918, as compared with shipments of 857 tons in the preceding month of 1917. Tin and terne plate dropped from 24,025 tons to 19,958 tons in the month of January; sheets and plates, from 84,882 to 50,199; steel bars, from 78,569 to 73,772, and wire nails, from 16,829 to 8071 tons during the same period.

EXPORTS, GROSS TONS.

	Pig iron	Semi-finished material
1916		
Jan.	19,319	55,315
Feb.	15,061	87,406
Mar.	19,439	107,674
Apr.	18,518	88,764
May	28,293	142,782
June	48,770	116,316
July	28,718	135,827
Aug.	60,264	160,921
Sep.	64,122	163,104
Oct.	92,756	162,669
Nov.	106,781	120,883
Dec.	105,195	162,901
1917		
Jan.	69,146	183,656
Feb.	49,018	131,566
Mar.	69,629	193,469
Apr.	44,783	162,209
May	61,112	168,158
June	81,999	192,133
July	32,368	112,085
Aug.	62,083	189,083
Sep.	44,287	148,932
Oct.	47,200	204,724
Nov.	25,733	150,120
Dec.	66,573	204,555
1918	.....	.....
Jan.	20,581	195,385

Produces Much Ore

Seven grades of iron ore are being produced from the Hull-Rust open pit mine at Hibbing, Minn., and continuous shipments have been made from it since 1897. Up to Jan. 1, 1918 this mine produced 41,232,421 tons. During the first year of its operation 31,982 tons were shipped and the output steadily increased. The largest annual production was for 1916 when the shipments comprised 7,665,611 tons.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

HERMANN A. BRASSERT, who has been connected with the United States Steel corporation since its organization, has resigned his position as assistant general superintendent of the Illinois Steel Co., South Chicago, in order to devote himself to his personal interests. As vice president of the Miami Metals Co. and subsidiary companies, he will have charge of their operations in the production of ferromanganese. Mr. Brassert also will act as consulting engineer for Freyn & Co., engineers and contractors. He will associate himself with Francis H. Hardy and Chester D. Tripp in the firm of Brassert, Hardy & Tripp, to act in a consulting and advisory capacity on commercial and operating problems in the iron and steel and affiliated industries. Mr. Brassert will remain in Chicago, with offices in the Peoples Gas building.

Clayton Mark, W. L. Brown and C. T. Boynton, Chicago, were elected directors of the By-Products Coke Corp., Chicago, recently.

Charles D. Rawstorne was recently elected vice president of Freyn & Co., engineers and contractors, 643 Peoples Gas building, Chicago, and Frederick H. Willcox was made secretary.

Fred T. Llewellyn, who for 11 years has been an engineer in the New York office of the Carnegie Steel Co., temporarily is located in Pittsburgh, to look after the interests of the Federal Shipbuilding Co.

C. H. Newcomb, resident manager of Crocker Bros., Philadelphia, pig iron brokers, won high honors at the recent Pinehurst, N. C., shooting tournament and was awarded the Pinehurst gold medal for 1918.

L. A. Larsen, formerly assistant to the president of the Lima Locomotive Works, Inc., Lima, O., has also been appointed secretary and treasurer to succeed W. D. Cloos, who recently resigned.

P. K. Aldrich with the title of president and general manager, has formed the Superior Side Bearing Co., 922 Webster building, Chicago. He was formerly with Edwin S. Woods & Co., Chicago.

W. M. Faber, plant engineer of the American Steel & Wire Co., Cleveland, was made chairman of the fuel service committee of the Cleveland Engineering society, which was formed recently to conserve fuel.

William J. Laffrey has been made Michigan district sales manager for the West Penn Steel Co., Brackenridge, Pa., with an office in the Dime Bank building, Detroit, to succeed George R. Fink, who has entered the United States military service.

E. L. Marshall, who recently resigned from the railway sales department of the National Carbon Co., Cleveland, has been succeeded by A. E. Pratt, who for several years has been signal superviser of the Erie railroad at Marion, O.

J. D. Gallery was elected a member of the board of the Westinghouse Air Brake Co., Pittsburgh, to succeed Cyrus S. Gray, deceased. Benjamin G. Becker of Chicago was added to the directorate, making the board number 10 instead of nine as heretofore.

Henry M. Hower, who has been manager of the Knight division of the Willys-Overland Co., Toledo, will represent the government for the duration of the war, in the management of a plant at New London, Conn., for the manufacture of naval supplies.

William W. Cotter has been made works manager for the Turner & Seymour Mfg. Co., Torrington, Conn., manufacturers of hardware, to succeed H. H. Leonard, who recently resigned. Mr. Cotter was formerly assistant superintendent of the Ansonia, Conn., branch of the American Brass Co.

Morris Metcalf, vice president of the American International Steel Corp., subsidiary of the American International Corp., has temporarily assumed the duties of the president's office, pending the election of a president to succeed the late Edward McKim Hagar.

J. Fred Smith, formerly vice president and secretary, was made chairman of the board of directors of the Stover Mfg. & Engine Co., Freeport, Ill., a newly created position, at a recent meeting of the board. W. A. Hance was made president and re-elected treasurer.

Frank W. Hutchings, H. H. Bingham and George J. Webster, treasurer, secretary and general manager, respectively, of the Charcoal Iron Co, of America. Detroit, each were honored with the additional rank of vice president at a recent meeting of the board of directors in New York.

Benjamin F. Groat, hydraulic engineer, Pittsburgh, was awarded the Norman gold medal of the American Society of Civil Engineers, for the presentation of his contribution to engineering science, "Chemihydrometry and Its Application to the Precise Testing of. Hydroelectric Generators".

A. C. Baker, sales manager and assistant secretary of the Cleveland Steel Co., Cleveland, has been made a commissioner of the American Junior Naval and Marine Scout organization, whose executive offices are in New York. He will have charge of the campaign for recruits in the Cleveland district.

George B. Kerr, Chicago manager of the Scovill Mfg. Co., Waterbury, Conn., recently celebrated the golden anniversary of his connection with the company, having entered its employ as an office boy in 1868. A banquet was tendered him by the Chicago staff and he was presented a silver loving cup.

Walter E. Brown, who for many years was office manager of the Youngstown Iron & Steel Co., Youngstown, O., and recently auditor of the Sharon Steel Hoop Co.'s office in that city, resigned recently, effective March 7, to take charge of the stock farms of Jonathan Warner, president of the Trumbull Steel Co., north of Youngstown.

Richard F. Grant, who became a member of the firm of M. A. Hanna & Co., Cleveland, early in 1917, having been the firm's counsel since 1909, has been appointed Lake division director of the next Red Cross war fund campaign from May 6 to 13, by James R. Garfield division manager. Mr. Grant was at one time a member of the Minnesota legislature and served in the house of representatives in 1908 and 1909. In November of the latter year he located in Cleveland as counsel for M. A. Hanna & Co.

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

E. ALLEN MOORE, vice president of the Stanley Works, New Britain, Conn., was elected president at the annual meeting, Clarence F. Bennett, second vice president, being promoted to the first vice presidency. No successor was named to Mr. Bennett. William H. Hart, chairman of the board of directors, who is 83 years old and who has held elective office in the corporation continuously for 63 years, tendered his resignation. He is succeeded by his son, George P. Hart, the company's former president. Other members of the board were re-elected as were officers, as follows: L. Hoyt Pease, treasurer; L. W. Young, assistant treasurer; H. B. Humason, secretary, and Walter H. Hart, assistant secretary.

W. B. Stratton, of Toledo, and Allen Smith, of Niagara Falls, have been made directors of the Curtiss Aeroplane & Motor Corp., Buffalo.

George T. Kimball, secretary of the American Hardware Corp., New Britain, Conn., has been elected a director of the corporation.

Edwin A. Carter, vice president of the Chapman Valve Mfg. Co., Indian Orchard, Mass., has been made chairman of the Springfield, Mass., fuel committee.

Herbert Howard Bassett, Worcester, Mass., who served as contracting engineer for the Berlin Construction Co., Berlin, Conn., has received a major's commission in the engineer reserve corps of the national army.

Randolph S. Jones, an executive officer of the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn., was a guest of honor at a banquet at the Lorraine hotel in Bridgeport recently to celebrate his 30-year affiliation with the company.

Kurt R. Sternberg, formerly treasurer and general manager of the Dickinson Mfg. Co., Springfield, Mass., and president of the Employers' association of Hampden county, has assumed his new duties as consulting chemist for the Johns-Pratt Co., Hartford, Conn.

Henry Keohler, formerly with the Crucible Steel Co. of America, is now superintendent of the L. S. Brach Supply Co., Newark, N. J. Louis Rise, formerly with the Crocker-Wheeler Co., Ampere, N. J., and Herman Rose have been appointed production engineers of the Brach company.

W. H. Thompson, who for many years has been prominent in the heavy electric traction work of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has resigned to accept the position of works manager of the Fairmont Mining Machinery Co., Fairmont, W. Va., maker of coal mining equipment.

William Waring, formerly Philadelphia district representative of the Galion Dynamic Motor Truck Co., Galion, O., has joined the organization of the Lakewood Engineering Co., Cleveland, which recently purchased the Galion company, and will serve the trade in the Pennsylvania territory in connection with factory and warehouse trucking and tractor problems.

Clinton B. Amorous, who because of his knowledge of gasoline engines and his powers of organization, was granted a major's commission in the signal corps of the aviation section was for many years affiliated with the sales force of the Locomobile Co., of America, Bridgeport, Conn. He is one of the youngest majors in the United States army. He is stationed at Washington at present.

Joseph W. Powell, promoted from the presidency of the Fore River Shipbuilding Corp. to the position of vice president of the Bethlehem Shipbuilding Corp, Ltd., in charge of all shipbuilding activities, recently was tendered a dinner at the Fore River club house, Quincy Point, Mass., by officials of the Fore River and Squantum, Mass., plants. He was presented with a pigskin traveling and brief case with silver and cut glass fittings.

C. E. McArthur, who recently resigned as superintendent of the J. I. Case Threshing Machine Co., Racine, Wis., to accept the position of works manager of the Barnes Foundry & Machine Co., has resigned. He has been made foundry superintendent of the Greenlee Foundry Co., Chicago. Plans to make automobile castings have been temporarily abandoned by the Barnes company, owing to unsettled business conditions and this made the change necessary.

W. J. Haggerty, who for several years has been assistant engineer in the furnace and gas producer department of the Wellman-Seaver-Morgan Co., Cleveland, resigned recently to become cost accountant of the Lakewood Engineering Co., Cleveland, manufacturer of industrial equipment such as trucks, tractors, mine and quarry cars, buckets, etc.

Charles Rodelius has been appointed superintendent of the Deere & Mansur plant at East Moline, Ill., of the John Deere Plow Co., Moline, Ill., to succeed C. E. White, who recently resigned. Mr. Rodelius has been assistant superintendent for many years. H. B. McKahin has been made works manager of the Deere & Mansur plant, having been promoted from the position of general manager of the Marseilles works of the company.

H. W. Knowles has been transferred from the New York office of the Cutler-Hammer Mfg. Co. to Washington, where he will remain as a representative of the Cutler-Hammer company during the period of the war. Mr. Knowles entered the service of this company shortly after graduating from Cornell university in 1912. He spent nearly five years in the shops, engineering department and sales department of the company at the main office and works in Milwaukee. Mr. Knowles' headquarters are at the Bradford, Eighteenth and K streets, Washington.

M. W. Crawford, who for many years has represented the Greenfield Tap & Die Co., Greenfield, Mass., in the Detroit territory which was recently extended to include Indiana, and H. S. Huncke, formerly sales promotion manager of the company's Greenfield plant, have formed the firm of H. S. Huncke & Co., 74 congress street, Detroit. It will represent the Lincoln Twist Drill Co., Taunton, Mass., high speed twist drills, and the Bicknell-Thomas Mfg. Co., Greenfield, Mass., friction chucks and taps, in addition to the Greenfield Tap & Die Co.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Steel Stocks Are Valued Conservatively

EXCEPT in times of severe industrial depression, the rate of works' operation in the iron and steel industry rarely falls as low as in the first two months of 1918, when paralysis of the railroads and fuel shortage interposed difficulties that could not be overcome the situation in these respects looks somewhat brighter, but the average earnings of steel companies, as will be shown by their reports for current quarter, will present a decided reduction from a year ago. Just now steel shares are holding their own, for recent annual statements have shown results for 1917 after taxes which compare favorably in many cases with those of the banner year 1916. However, the prices of the steel stocks are far from compatible with the earning power displayed within the past two years of the companies they represent. The following tables indicate how steel stocks have moved in the face of unprecedentedly large earnings. The first table shows the earnings per share of several of the leading companies in the years 1917 and 1916 and the total earnings per share in the two years:

	Earned per share in 1917	Earned per share in 1916	Total earned in two years
U. S. Steel	$39.20	$48.46	$87.66
Midvale	17.12	16.11	33.23
Lackawanna	45.89	34.81	80.70
Republic	52.78	37.58	90.36
Bethlehem	44.20	71.57	115.77
Crucible	18.87	44.39	63.26

The next table shows the total earnings for the two years 1917 and 1916, with the amount of dividends per share paid and the surplus earnings after dividend payments:

	Earned in two years	Divs. paid	Surplus after divs.
U. S. Steel	$87.66	$26.75	$60.91
Midvale	33.23	6.00	27.33
Lackawanna	80.70	.....	.....
Republic	90.36	7.50	82.86
Bethlehem	115.77	18.00	97.77
Crucible	63.26	none	63.26

The next table shows the market prices of the stocks of the various companies on March 1, 1918, and on March 1, 1916, together with the net change over the intervening two years:

	Mkt. pr. Mar. 1, 1918	Mkt. pr. Mar. 1, 1916	Chg. in two years
U. S. Steel	96	116	—20
Midvale	45	63	—18
Lackawanna	77	75	+ 2
Republic	77	51	+16
Bethlehem	80	*117	—37
Crucible	64	73	— 9

*Actual quotation March 1, 1916, was 468, the common stock then being $14,862,000, since being increased to $59,448,000.

Think War Effects Discounted

Certainly the stock market has discounted all probable exigencies arising out of war-time conditions. These figures supply food for thought. United States Steel, which two years ago was quoted 115, has earned a surplus of $60.91, after all charges, taxes and dividends, yet its price has declined $20 per share. Republic Iron & Steel two years ago was quoted only 51. It has added $88.26 surplus earnings after all charges, including 11 per cent in back dividends on preferred, yet its market price has advanced only $15 a share. No effort is made in the foregoing tables to compare the values of the respective shares, for in such a comparison the earning power and the value of the shares in previous years would have to be taken into account. But the figures do show the conservative valuation which the stock market puts on the steel industry in war times.

Lackawanna Steel Has Its Best Year in 1917

Net profits for the year ended Dec. 31, 1917, reported by the Lackawanna Steel Co. were by far the largest in history and totaled $16,106,976, as compared with $12,218,234 in 1916, an increase of $3,888,742. In terms of stock, the company's earnings on the $35,096,500 outstanding common stock were at the rate of 45.89 per cent a share, as against 34.81 per cent in 1916. The company's report of unfiled tonnage as of last December shows a decrease from one year ago. The latest figure is 731,526 gross tons as compared to 811,126 in 1916.

Total deductions of interest on bonds, including premiums on gold notes and royalties and rentals shows a drop from last year of $364,768 while appropriations for extinguishment and depreciation amounting to $2,201,662 show an increase of $178,085. The profits for the year of $16,106,976 reveal a gain over the previous year of $3,888,741. The comparative income account of the company follows:

	1917	1916
Total net earnings after ordinary expenses, repairs and maintenance but not renew.	$19,793,916	$16,090,858
Bonded interest, rents and royalties	1,485,278	1,850,047
Balance	18,308,638	14,240,811
Extinguishm't of mines and mining investment and deprec.	2,201,662	2,022,576
Profit	16,106,976	12,218,234
Unfilled orders	731,526	811,126

Penn Seaboard Assets Grow Rapidly

The Penn-Seaboard Steel Corp., organized in December, 1915, did a gross business of $10,544,000 in 1917, on which it earned a net profit of $1,045,000 after all deductions, including taxes. Two note issues of $500,000 each were paid off during the year, and dividends of $240,000 paid, but surplus to profit and loss increased $479,000 and current and fixed assets increased $2,220,000. President Rodney Thayer states that arrangements have been completed for installation at the Newcastle plant of the necessary machinery for manufacture of plates for ships, locomotives and cars, involving an expenditure of about $2,000,000.

New York Air Brake's Net Declines During 1917

While the New York Air Brake Co. shows net earnings of $1,893,825 for 1917, or one-fifth of what they were in 1916, prospects for the present year are unusually bright, according to President C. A. Starbuck, who says to fill government munition or-

ders in excess of $30,000,000, four large steel and concrete buildings had been constructed. Orders for air brakes on hand aggregate $6,000,000, while munition orders in several cases run into 1920. From January to November, 1917, no munition orders were received and in 1916 munitions brought most of the gain. A comparative income account follows:

	1917	1916
Sales	$10,157,038	$24,051,103
Mfg. cost	7,792,145	14,083,281
Mfg. prof.	$2,364,892	$9,967,822
Other inc.	112,292	93,894
Total inc.	$2,477,184	$10,061,715
Adm. ex., etc.	403,359	466,753
Interest	180,000	180,000
Depreciation	.....	1,200,000
Net profit	$1,893,825	$8,214,962
Dividends	*1,986,980	1,149,126
Deficit	$93,155	‡$7,065,836
Previous surp.	8,082,591	1,016,754
Total surplus	$7.989,436	$8,082,590
Taxes for 1916	1,090,351	.....
1916 adjust.	418,256	.....
Surplus	$6,480,829	$8,082,590

*Dividends declared out of 1916 surplus.
‡Surplus.

The earnings in 1917 were equal to $18.94 per share, compared with $82.15 in 1916. The net earnings reported do not include, it appears, excess profits taxes, on which account a reserve of $100,000 is set aside in the balance sheet. Deducting this sum from the reported earnings would make the net for stock $17.94 a share.

Empire Steel and Iron Has Most Prosperous Year

For the year ended Dec. 31, 1917, the Empire Steel & Iron Co., Catasauqua, Pa., earned 50.2 per cent on the $1,254,774 common stock outstanding in 1917, as against 28 per cent in 1916. Last year was the most prosperous in the company's history since net income, including $62,237 earned by the Crane Iron Works, was raised to $630,674, as compared with $360,386 the year before.

The company's current assets jumped from $1,059,921 in 1916 to $1,598,626.96 in 1917. The cash position rose from $190,007.91 in the previous statement to $351,508.72 in the latest one. The comparative income account and balance sheet of the company follows:

	1917	1916
Gross income	$1,800,250.91	$666,627.25
Deprec. and depl.	$147,631.33	94,490.74
Int. coll. notes	8,625.00	11,750.00
Int. Crane Iron, bonds	25,820.00	.....
Res. for bad debts	25,000.00	.....
Total net income	$1,593,174.58	$560,386.51
Fed. tax res. cont.	500,000.00	.....
Less res. for cont.	75,000.00	.....
Net profit	$1,018,174.58	$560,386.51
Prfd. dividend	387,500.00	200,000.00
Surplus	*630,684.58	360,386.51

In his statement to the stockholders, President Leonard Peckitt says: "We can draw no parallel with the year 1917 because, from a purely business standpoint it marked (1) the culmination of the inevitable pyramiding of prices resulting from a constantly increasing demand for raw and manufactured products of all kinds by the European nations at war; and (2) the entry into the war by the United States, immediately converting it into the world's largest purchaser whose demands were to be given preference above all others." Mr. Peckitt says that the average monthly earnings of employes during one of the latter months of 1917 shows an increase in comparison with the corresponding months five years before of 117½ per cent, and with the same month two years ago of 96½ per cent.

The pig iron production of 254,586 tons was the largest for any single year in the history of the company. The ore mined during the year was 276,334 tons.

During the year the company retired $75,000 of collateral notes, $20,000 tons of Crane Iron Works bonds and $245,000 of notes payable.

Financial Crop Ends

The annual meeting of the stockholders of the Republic Iron & Steel Co. will be held in Jersey City, 11 o'clock, Wednesday, April 17.

* * *

The Seaboard Steel & Manganese Corp. will hold its annual meeting of stockholders, March 16, at 74 Broadway, New York City.

* * *

On April 9, stockholders of the Sharon Steel Co., Sharon, Pa., will meet to vote on increasing the capital stock from $10,000,000 to $15,000,000.

* * *

The Milwaukee Steel Post Co., 415 Iron block, Milwaukee, Wis., has changed its name to the Newark Steel Post Co.

* * *

The American Metal Concern, Inc., 1147 South Washtenaw avenue, Chicago, has changed its name to the American Metal Co. and has increased its capital from $5000 to $15,000.

* * *

The Perkins Machine Co., 216 North Jefferson St., Chicago, has changed its name to the Wittenmeier Machinery Co. and has increased its capital from $4000 to $10,000.

* * *

Reports are current that a merger between the Dominion Steel Corp., Sydney, N. S., and the Nova Scotia Steel & Coal Co., New Glasgow, N. S., is being given consideration.

* * *

That the Detroit Architectural Iron Works has merged with the Page Steel & Wire Co., Adrian, Mich., is a statement made by A. L. Stewart of the Detroit plant.

Sulphate Orders

Again to be Distributed by Government—Toluol Brings Premiums

New York, March 2.—Producers of coal tar products learned this week that the government is about to make a second allotment of orders for sulphate of ammonia. Nothing yet has developed as to the size of the quantities to be required. With the exception of this feature, the market in sulphate of ammonia is quiet and sales comprise only an occasional spot carload. This business is being done at $5.25 to $5.35 per 100 pounds at seaboard. Output of sulphate of ammonia now is at the rate of about 80 per cent of capacity, and this figure is representative of the present output of all coal tar products at this time.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant
Pure benzol ..... $0.35 to .40
Toluol ..... (nominal)
Solvent naphtha ..... .18 to .22

Per Pound at Producers Plant
Phenol ..... $0.52 to .55

Per 100 Pounds at Seaboard
Sulhate of ammonia (nominal) ..... $5.25 to 5.35

Contract

Per Gallon at Producers Plant
Pure benzol ..... $0.35 to .40
Toluol ..... nominal
Solvent naphtha ..... .18 to .22

Per Pound at Producers Plant
Phenol nominal.

Per 100 Pounds at Seaboard
Sulphate of ammonia ..... nominal

In benzol, interest continues to be centered in the question as to whether or not the government will decide to requisition this product for the manufacture of picric acid. It now is felt that several months will elapse before a decision will be made. Business this week has been of fairly large proportions. Owing to the large production, however, the tone continues weak. Pure benzol is quoted at 35 to 40 cents per gallon, but it is certain that unusually large orders could be placed at less.

Toluol is unchanged. The government energetically is commandeering supplies as fast as they accumulate so that consumers who are not making trinitrotoluol have great difficulty in obtaining deliveries on old contracts. Second hands occasionally have small lots to offer, and it is understood that on these as high as $5 and $6 per gallon is being asked. As far as producers are concerned the market is entirely nominal.

Housing Plan Taking Form

Prospect of $100,000,000 Appropriation Soon Becoming Available Speeds Up Preparations—How Fund Will be Handled

WITH the signing in immediate prospect of the bill approved by senate and congress which will appropriate $50,000,000 to meet the housing problem in shipyard districts and a like amount in other war industries, interest in the proposition of supplying workmen with suitable living quarters has broadened greatly. Much activity along this line engages the thought and attention of industrial heads.

J. Rogers Flannery, director of housing for the Emergency Fleet corporation states that the $50,000,000 appropriated by congress for use in shipbuilding territories will be expended exclusively in the congested area along the northern Atlantic seaboard and explains the method of obtaining such funds as follows:

"The shipbuilding company will apply to the Fleet corporation for the loan of a specific sum of money with which to construct housing accommodations for its present employes or those it expects to employ in the immediate future.

Should the Fleet corporation, after investigation, determine such housing necessary, it will loan to the shipbuilding company the money required to defray the actual cost of constructing the necessary housing facilities. The Fleet corporation loan will be amortized over a period of 10 years, bearing interest at the rate of 5 per cent payable semiannually, and be secured by a first mortgage upon the real estate upon which the development is had. The men will be protected from high rentals.

"The loan being assured, the shipbuilding company will organize a subsidiary company which will acquire at its own cost and expense and hold in its own name, real estate upon which the houses would be erected.

"This subsidiary company will have charge of the maintenance, the renting and sale of these houses; it will be restricted in its right to pay dividends, salaries and various other expenses, until such time as the loan to the Fleet corporation had been entirely paid, and even then these restrictions will be continued beyond that time, for the benefit of the owners of the houses and of those persons living in that vicinity, and above all for the protection of the men."

In Youngstown, where 5000 houses are needed now and where 3500 men will be added during 1918 in new iron and steel employment, a $1,200,000 corporation has been formed to build 750 structures a year. Assets of two construction companies which merged to form this new concern will absorb the common stock and a like amount of preferred stock will be purchased by manufacturers and business interests. The Merchants' Shipbuilding Corp., Bristol, Pa., which is constructing part of the war fleet of merchant ships, is building a city to house 3000 of its workmen and their families. It is estimated the population of this new city will be 10,000. E. A. Morse, president of the Groton Iron Works, Groton, Conn., states that the company will furnish 10 per cent of the $1,500,000 to be expended in the near future to house its employes and the balance will come from the government. The latter will take first mortgage on the property.

For every $200,000 Wilmington, Del., citizens subscribe, the government will put forward $800,000 and the city $600,000 to raise $3,000,000 to meet the housing of labor problem there in the shipbuilding industry, if plans of the recently incorporated Wilmington Housing Co. are worked out.

Advance Funds to Men

Because in many steel plants, particularly in the east, fuel shortage, railroad congestion, embargoes, etc., have brought about curtailed operations, and wages, several companies have arranged to advance money to the men, who have maintained good records. It is the thought of the heads of organizations confronted by this necessity, that to make an investment of this sort under present labor market conditions, is better than to run the risk of losing the workmen when normal operations will obtain.

Puddling Rate Goes to New High Point

At the recent bi-monthly wage settlement in Youngstown between the Western Bar Iron association and the Amalgamated association of Iron, Steel and Tin Workers, an average sales price of $3.10 per 100 pounds for bar iron was disclosed for the January-February period. This compares with $2.95 which applied during November and December. This increase of 15 cents increased the boiling rate from $14.30 to $15.05 a ton, the largest single advance since the last bi-monthly period of 1916 when the average price went from $2 to $2.15. Secretary J. H. Nutt, of the Bar Iron association announced that this settlement brought finishers an advance of 7½ per cent. In the January-February period, 1916, the average sales price of bar iron was $1.40, meaning a boiling rate of $6.90 a ton and the present rate exceeds any level attained in recent years. The bimonthly bar iron average price per pound and the resulting puddling rate per ton are as follows:

	1917		1918	
Jan.-Feb.	2.35c	$11.30	3.10c	$15.05
Mar.-Apr.	2.45c	11.80	.....	.....
May-June	2.65c	12.80	.....	.....
July-Aug.	2.75c	13.30	.....	.....
Sept.-Oct.	2.85c	13.80	.....	.....
Nov.-Dec.	2.95c	14.30	.....	.....

Creates Trust Fund

A trust fund of $100,000, devoted to the support and relief of employes of the Matthiessen & Hegeler Zinc Co., the Western Clock Co., the La Salle Machine & Tool Co., and the La Salle & Bureau County Railroad Co., La Salle, Ill., has been established by a provision of the will of the late F. W. Matthiessen, who was head of these companies. The fund will be known as "the F. W. Matthiessen Fund for Employes".

Labor Notes

Twelve strikes were called in Canada in December which involved 25 firms employing 3209 people. This caused a loss of 33,192 working days.

Approximately 4000 metal workers in shipyards at New Orleans have called off their strike and have returned to work.

To limit the workday for all classes of labor to eight hours, three bills have been introduced in the Kentucky legislature at Louisville.

To stimulate interest in their work, the Ingersoll-Rand Co., Easton, Pa., has offered to its employes a bonus of 10 per cent to all who lose no time for an entire month.

As a further complication in the loading of ocean bottoms, freight handlers on the docks of the Eastern District Terminal Co., Brooklyn, N. Y., recently struck because their demand for an increase of $4 a week over their present wage of from $22 to $26 a week, was refused.

Posters are being distributed by the United States civil service commission, advertising for 14,850 men and women to fill positions in the ordnance department of the army to serve in the United States. The list includes clerical, testing, inspection, mechanical trades and drafting positions, at salaries ranging from $800 to $2400 a year. Communications should be addressed to John A. McIlhenny, president of the commission, at Washington, D. C.

Tool Demand Less as Output Falls

Inquiries Grow Fewer in Number—February Records Show Effect of Fuelless Monday—Second Ordnance Base Depot Will Be Built in France—Crane Requirements of Navy Yards Are Important

ASSIMILATION, by machine tool builders, of their many orders for equipment was interrupted during February by shortages of fuel and difficulties in making deliveries, not to mention the deterrent effect of the government's slowness in making payment for equipment purchased. New England builders, in particular, were seriously affected by the lack of sufficient coal for manufacturing purposes. Many machine tool builders throughout the country who had difficulty in ascertaining whether they were permitted to operated on workless Mondays were placed on the list of exempted manufacturers when assurance was given that production would be concentrated on essential government work. In cases where only part of the plant was engaged on government work, that part was permitted to operate, while the remainder was closed. This contributed to a much-improved situation among manufacturers and finally, with the removal of the Monday closing order, builders resumed maximum operations; their limitations varying principally with their ability to secure fuel and to make shipments.

Shipping Permits are Source of Confusion

The time required for shipments was long in comparison with the normal, and dealers were annoyed, mainly, by the procedure to be followed in obtaining priority numbers, by shipping permits, and by government commandeering of tools. Due to railroad embargoes, dealers have been obliged to obtain shipping permits for tools in addition to the usual priority certificates. Several cases are known where manufacturers had machines ready for delivery under a certain priority number, but delivery was deferred owing to the inability of the buyer to obtain a shipping permit. In some instances other buyers in the meantime presented an advanced priority certificate to the builder and a shipping permit. Delivery was then made to the latter, and the original buyer was forced to wait several months for the machine to which he had previously been entitled. The effects of embargoes, at least so far as machine tools are concerned, are now rapidly being neutralized in the scheme which several shippers are using. This consists in wiring for the name of the government's inspector at the plant of the consignee and shipping the machines in his name. Government commandeering has been troubling dealers. In some cases shipments from builders' plants failed to arrive for more than 60 days.

Respite from Large Inquiries Prevails

A temporary respite from large inquiries has been observed in market centers. Authorization for new army construction work which will aggregate several million dollars recently was given to Gen. I. W. Littell, in charge of construction. The expenditure of this sum, it is thought, will be reflected in the machine tool market. The authorizations include two new ordnance base depots, which are to be built on the Atlantic coast; one to cost $6,000,000; the other, $4,000,000. Other authorizations aggregating $100,000,000 were made, but these are for projects which it is not likely will have any material effect on the market. Negotiations are still being carried on by the government, preliminary to the letting of contracts for making shell forgings, which, it is estimated, will involve an outlay of about $200,000,000.

Tool Business is Well Distributed

Several companies took a prominent part in the market activities of the month. The Worthington Pump & Machinery Corp. inquired for several hundred machine tools said to have been needed for its Deane Pump Works at Holyoke, Mass., in order to carry out a government contract for submarine destroyer pumps. Lately, however, it is reported that the Worthington corporation will allot most of this contract to its Harrison, N. J., works. A long list of tools was issued by the Aeronautical Engine Co., which was formerly the General Vehicle Co., Long Island City, N. Y. This list covers about 100 machine tools. The navy department inquired for approximately 40 machines of various types for its Brooklyn, Boston and Charleston navy yards. Additional tools are required by the Studebaker Corp., South Bend, Ind., in order to expedite its work on recoil cylinders. Other inquiries include those from the Watertown arsenal; the Submarine Boat Corp., New York, for several 72-inch planers, and the Savage Arms Co., Utica, N. Y. The Wagner Axle Co. received a contract for artillery wheel hubs and closed for $100,000 worth of equipment shortly afterward. The W. F. McCord Co., Chicago, bought equipment totaling several hundred thousand dollars, following the receipt of a government order for artillery wheels. Lathes, boring mills and drills, aggregating about $100,000, were purchased for the Watervliet arsenal. Some used equipment was purchased by the Federal Shipbuilding Co., from a Long Island plant and transferred to Federal company's shipyard at Newark Bay. The value of this equipment is placed at $100,000.

Navy Yards' Crade Needs are Large

By far the greatest interest in the crane market has centered around the government's crane requirements for the Washington and Philadelphia navy yards. One lot for the Washington navy yard involves approximately $600,000. Equipment purchased by the government for its explosive plant at Charleston, W. Va., included 49 2-ton hand-power traveling cranes and 21 2-ton chain hoists. J. N. McKinney, Chicago, was awarded the contract for this equipment. Shipbuilding companies were the source of numerous inquiries for cranes. The Atlantic Corp., Portsmouth, N. H., was awarded a contract for 10 steel ships by the government and immediately made plans for enlarging its plant. Its locomotive crane requirements are to be filled by the Brown Hoisting Machinery Co., Cleveland. The inquiry made by the Groton Iron Works for four 5-ton electric traveling cranes to have a span of 80 feet, which are to be used in its shipyard at Alexandria, Va., has been partially filled.

Trade's Efforts Center in War Work

Contract for Machine Guns Produces Large Tool Sale—Chicago Interests Plan Great Shellmaking Plants—Emergency Fleet Corporation Awards $5,000,000 Equipment Order—To Build New $25,000,000 Ordnance Base in France

CONCENTRATION of the nation's production facilities on war material is reflected in the machinery market. Manufacturers throughout the country are responding to the call for munitions and ships and zealously turning their efforts to the making of these essentials. The government has ordered a New York arms company to proceed with an order for Lewis machine guns. As a consequence, this company has purchased about 200 additional machine tools for its plant. Contracts for Browning machine guns are being held up temporarily for the reason that manufacturers already have their manufacturing capacities well taken with war work of other kinds. Chicago interests are promoting two great projects for making 155-millimeter shells; one of these is backed by the Chicago Association of Commerce. Several of the country's best known automobile companies are engaged in the manufacture of airplane motors and a high production rate has been attained. Interest attaches to the recent awarding of a contract by the Emergency Fleet corporation to a Texas shipbuilding company for equipping 22 wooden ships which are now being built at various gulf shipyards. Announcement has been made by the war department confirming the rumor that a second ordnance base depot will be built in France which will require machine tool equipment aggregating $5,000,000. This depot will cost $25,000,000 and includes 20 large storehouses, 12 shop buildings and 100 smaller shops.

Tools intended for export, in some cases, have been commandeered by the government and held in reserve; further, the government maintains control of several plants and is supplying these tools to government contractors when they are unable to secure them elsewhere. Import and export licenses are required for shipments to France and while machinery may be sent to Italy, few tools go to that country because of the difficulties encountered in securing cargo space. Exports of tools to South America and the Far East are under no government restrictions.

Tool Shipments Manifest Marked Improvement

LEADING sellers of machine tools some months ago viewed with anxiety the situation then developing, due to the machinery requirements arising from our extensive war preparations. Machine tool builders were already sold up many months ahead, with the peak of the business coming. Deliveries were becoming more and more delayed, until it appeared as though vital preparations could not be undertaken for a year or more, due to the lack of essential equipment. Today there is a perceptible lull in the market, following many months of the greatest agitation ever experienced. One of the largest sellers states that his shipments last month were less than his orders for the first time in over two year. This was due partly to the fact that bookings are so large that sellers can afford to discriminate in favor of the choicest offerings, but partly because there was less actual business offered. Railroad restrictions are not entering into the shipments of machine tools particularly, as nearly all machines now completed are needed for government work, with a permit forthcoming. In many cases, to save time, shippers are wiring for the name of the government inspector at the consignee's plant and shipping the machines in his name. This procedure is authorized under the rules, but it renders the embargoes almost a dead letter so far as machine tools are concerned.

Sale of Used Equipment Eases Tool Market

The principal reason for the slowing-up is the extensive utilization of used equipment. The high premium paid for second hand machines has served to mobilize such tools effectually. Also, the government has taken control of numerous plants over the country and has held their equipment in reserve, to be supplied to war contractors at their cost price. Still other plants are being taken over now and their machines appraised. The government also has commandeered many tools being held in warehouses at seaboard for export not only to Russia, but to other countries. For instance, 40 grinders consigned to a leading English dealer have been requisitioned by the government and are being held.

Market Shows Keen Interest in Pump Contract

Sellers in the east are watching with interest the activities of the Worthington Pump & Machinery Corp., which has decided to manufacture its order of Ford submarine destroyer pumps at Harrison, N. J., instead of at its Holyoke, Mass., plant, as originally planned. Most of the machines for this work have been purchased. The Foundation Co., 233 Broadway, New York, which has a contract to build 36 mine sweepers and is constructing a yard at Savannah, Ga., states it has obtained equipment necessary, but is in the market for pumps. The Submarine Boat Corp. remains in the market for a 46-inch and several 72-inch planers. The Morse Dry Dock & Repair Co. has been buying equipment for its extension in Brooklyn and still is in the market. The Savage Arms Co., Utica, N. Y., is reported to have bought more than 200 machines to cover additional orders for Lewis guns. However, more interest now is being shown in the requirements of the companies which will manufacture Browning guns, since this gun passed a successful test and now is regarded with much enthusiasm in official circles at Washington. The problem now is to increase production of Browning guns at the various plants. Tools may be supplied from the reserve stocks

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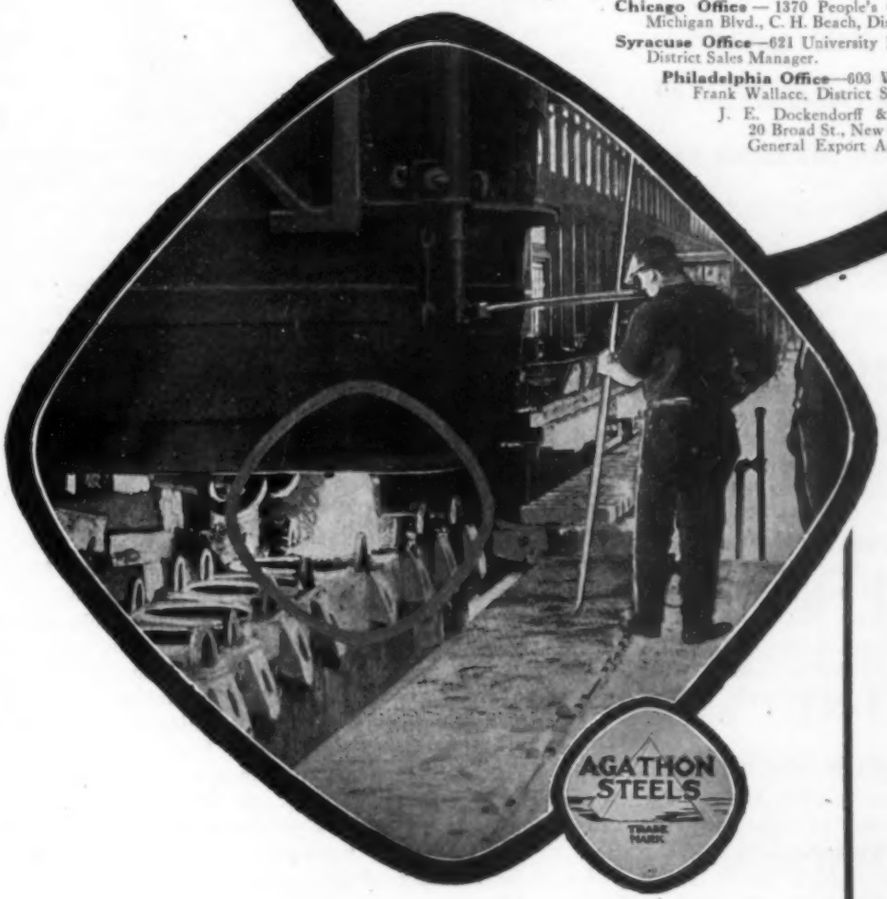
Chicago Office — 1370 People's Gas Bldg., 122 So. Michigan Blvd., C. H. Beach, District Sales Manager.
Syracuse Office—621 University Block, T. B. Davies, District Sales Manager.
Philadelphia Office—603 Widener Bldg., Frank Wallace, District Sales Manager.
J. E. Dockendorff & Co., 20 Broad St., New York, General Export Agents.



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of the government. The Colt's Patent Fire Arms & Mfg. Co. and the Remington Arms Co. are among those said to be making the Browning gun.

Production of Airplane Motors is Large

It is reported in the trade that the machinery of the Fiat Co., Poughkeepsie, N. Y., will not more than one-third fill the requirements of the Duesenberg Motor Co. for its Elizabeth, N. J., plant. It is also said, on good authority, that this plant will manufacture "Liberty motors" on a large scale. Manufacturers of airplane motors include the Chalmers Motor Co., Detroit; the Packard Motor Car Co., Detroit; the Stearns Motor Car Co., Cleveland; the Lincoln Motor Co., Detroit; the Westinghouse Air Brake Co. Pittsburgh; and others.

Shipments to Europe Almost Impossible

The Minneapolis Steel & Machinery Co., Minneapolis, which has gun mount and shell contracts, is said not only to have filled its requirements but may have some machines for sale. The Standard Steel Car Co., Hammond, Ind., is still buying against its ordnance contract. In the export field, sellers are finding it next to impossible to ship to Europe. Licenses are obtainable easily to Italy, but lack of shipping space makes such shipments difficult. Exports to France require both import and export licenses, which renders business difficult. Sales still are being made to South America and the Far East. Shipments of machine tools to the west coast are much easier than to the east.

Crane Demand Made Up of Small Inquiries

Crane demand at this time is made up of a few small miscellaneous inquiries, although the allotment of considerable business by the government is expected to be made public shortly. Included in this are cranes worth $600,000 for the Washington navy yard. Bids were closed on these cranes March 4, the date being extended from Feb. 25. Another large contract for government account is that involving 336 1-ton jib cranes for the use of the American expeditionary forces in France. Further requirements of the government, which now are pending, include one 20-ton, one 25-ton and two 10-ton electric cranes, under specification 2734, also for the Washington navy yard, and 30-ton electric crane, under specification 2809, for the Philadelphia navy yard. The Thompson-Starrett Co. has issued an inquiry for a 50-ton electric crane for the government explosive plant at Charleston, W. Va. This inquiry is regarded as an alternative to that recently issued by the Thompson-Starrett Co., calling for a 75-ton crane. The Hay Foundry & Iron Works, Newark, N. J., which is building an addition to its fabricating plant, is expected to be in the market shortly for several cranes. The Consolidated Rolling Mills & Foundries Co., New York, is expected to close this week on one 15-ton electric crane, with 60-foot span, and one 5-ton electric crane, with 30-foot span.

Two Shellmaking Plants are Proposed for Chicago

COMPARATIVELY quiet continues to mark the machine tool industry in Chicago; the lack of large inquiries, which has been the rule for several months, makes the present comfortable volume of business seem small. There is constant inquiry and booking of orders for various machines in single tools or small lots. This is especially true of 16-inch and 18-inch lathes, which are available from warehouses or for immediate delivery from makers. At least two extensive shellmaking plants are being tentatively planned for establishment in Chicago, and the market is being sounded as to the possibility of obtaining equipment. One company is planning to make 155-millimeter shells. The Arnold Co., of Chicago, engineer, is conducting negotiations for one large project and the other is under the auspices of the Chicago Association of Commerce. Price advances are being made from time to time on various lines, frequent announcement of 10 per cent additional being received. However, buyers do not complain of prices and the only point at issue usually is possible delivery. The Leader Iron Works, Decatur, Ill., is building an addition to its machine shop and making other improvements. The Coal Products Mfg. Co., Chicago, will build a benzol plant at Lockport, Ill. The Crane Co., Chicago, is adding another two-story building to its Corwith plant and making other improvements including a steel bridge and a reinforced concrete tunnel. The Ilg Electric Ventilating Co. will build a plant in Chicago to cost $750,000.

Shipments in Pittsburgh District Are Better

MAKERS and sellers of machinery and machine tools in the Pittsburgh district report that improvement has developed in the transportation situation and shipments can be made more easily. It is hoped that it will continue to become less difficult to make deliveries because this is one obstacle that is restraining buying on the part of domestic consumers, although high prices are another important factor. The government does not appear to be making any inquiries in this district for shell machinery. Preliminary to the placing of contracts an inquiry said to have come from the government is being made for 500 trailers for army trucks. A few small inquiries for machine tools in miscellaneous lines are out from buyers in surrounding towns. Key seaters and drill presses are included in the equipment wanted. Sales of rolling mill equipment are extremely limited. Mills requiring this equipment to produce government work make purchases direct but it is claimed that the policy of the government deprives manufacturers of any incentive in taking equipment. Some of the work placed by the government is taken on a percentage basis. This is held to be unsatisfactory. Other work placed on a direct contract basis apparently does not afford adequate profits. The Hudson Sheet & Tin Plate Co., Marietta, O., of which Howard R. Kirock is president, has bought some rolling mill equipment from the Mesta Machine Co., Pittsburgh. The Hudson company will begin soon to roll steel at its plant. The plant has six roll stands.

Cleveland Dealers Receive Many Inquiries

UNABLE to secure a sufficient number of new planers for its plant the Studebaker Corp., Detroit, Mich., which is a division of the Detroit Shell Corp., has sent an inquiry broadcast among dealers in used tools for all planers available between and including the sizes of 30 x 30 inches x 10 feet and 36 x 36 inches x 10 feet. The Standard Parts Co., Cleveland, has issued an inquiry for the following equipment for installation at its Hess plant at Carthage, near Cincinnati: One multiple spindle drill press with tapping attachment; one straightening press; one centering machine; one 24-inch x 8-foot bed tool room lathe; one No. 2 universal cutter grinder; one No. 3 universal-type horizontal milling machine; one 24-inch heavy duty shaper, and one 20-inch light drill press. Equipment requirements of the E. F. Hauserman Co., Cleveland, include a shaper, a 24 x 24-inch x 10-foot planer and one large inclinable press. The Cleveland Tractor Co., Cleveland, requires a 3-foot radial drill. Following are the tools contained in an inquiry from the Lowe Bros., Columbus, O.: One 40-inch vertical boring mill and one 12-inch stroke slotter.

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To Pig Iron Consumers:

Hannibal fought the Romans. His was a life of strife. He looks the part. His early successes were due to preparedness. He had the men and the weapons. Two years were spent working the mines and deforesting Spain to make charcoal. His equipment was the best. The workings show that his men selected the best ores. They did not know why. We know by analysis. He had no chemist save Experience. The country is still barren of wood and his mines are worked today. Hannibal and "Delaware" Iron are closely connected. These ores make "Delaware" Pig Iron. Hence its excellence.

Delaware River Steel Co.

"DELAWARE"

Say you saw it in THE IRON TRADE REVIEW

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

AUGUSTA, ME.—The Myles Standish Mfg. Co. has been incorporated with $250,000 capital by E. M. Leavitt, Ernest L. McLean, Clyde R. Chapman and others to manufacture metal specialties.

PORTLAND, ME.—The Enterprise Oil & Gas Co. has been incorporated here with a capital of $25,000 to engage in a general oil and gas business. Perley C. Dresser, Henry N. Taylor and Dennis A. Maher are interested.

BOSTON.—The 4-story factory at 76 Freeport street, Dorchester district, occupied by the Stuart-Howland Co., manufacturer of electrical equipment, was damaged by fire Feb. 17 with a loss of $35,000.

BOSTON.—The William S. Simpson Co., contractors' and masons' supplies, has been incorporated with a capital of $75,000 by William S. Simpson, Newton, Mass., M. K. Morse, Quincy, Mass., and E. L. Bunker, South Manchester, Conn.

BOSTON.—The Mobec Metals Co. metals and drosses, has been incorporated with a capital of $50,000 by William B. Nash, Brookline, Mass., John A. Sturtevant, Boston, and Forrest L. Mitchell, Melrose, Mass.

BOSTON.—The New England Power Co. plans to issue bonds to the amount of $560,000 to provide for additions and extensions to its plant.

BOSTON.—The factory occupied by the Joseph Pollak Tool & Stamping Co., doing government work, at 76 Freeport street, was damaged by fire to the extent of $25,000 Feb. 17.

BOSTON.—The Westerly Textile Co., tire cloth manufacturer, is in the market for new machinery, to provide which the capital of the company was recently increased to $300,000.

CAMBRIDGE, MASS.—The Stewart Bros. Co. has been incorporated to manufacture machinery with $5000 capital by J. M. Mannix, George M. Doring, Allston, Mass., and J. Drummey.

EVERETT, MASS.—The J. Duncan Co. is in the market for machinery to equip a small structural iron shop, including machine lathes, power punches, cutters, bolt drivers, etc. The company maintains offices at 7 Fulton place.

EVERETT, MASS.—Maxim Bros., 53 Bartlett street, plan to build a 1-story, 40 x 60-foot factory and machine shop to be of reinforced brick construction, to cost about $5000.

FALL RIVER, MASS.—The Watuppa Mfg. Co. has been incorporated with $40,000 capital by James H. French, Stephen L. French and William A. Hart.

HUDSON, MASS.—The Universal Boring Machine Co. has completed plans for the erection of a 1-story, 40 x 100-foot factory addition. The work will be under the supervision of Densmore & LeClair, engineers, Boston.

QUINCY, MASS.—The U. S. Turbine Mfg. Co. has been incorporated with $50,000 capital by George A. Weaver, Henry Hood and William H. Pletsch.

SPRINGFIELD, MASS.—Bids close March 5 for reinforced concrete, fireproof, 1-story, 100 x 160 and 25 x 35-foot additions to the factory of the United Mfg. Co., Birnie avenue.

SPRINGFIELD, MASS.—Plans are being prepared for a brick, 1-story, 32 x 92-foot building for a laboratory at the United States arsenal.

WALTHAM, MASS.—The Stark Tool Co. has been incorporated with a capital of $40,000 to manufacture tools. John Stark, Henri Haldy and Robert M. Stark are the incorporators.

WESTFIELD, MASS. — The Hamilton Abrasive Co., which has been incorporated with $50,000 capital by Frank D. Hamilton, Buffalo, and others, will build a manufacturing plant on the Mosley estate for the making of emery wheels and other abrasive products.

WORCESTER, MASS.—The plant of the William H. Sawyer Lumber Co., 66 Lincoln street, was damaged by fire Feb. 21 with a loss of more than $200,000.

PROVIDENCE, R. I.—The Nicholson File Co. is building three brick additions to its plant on Kinsley avenue.

BRIDGEPORT, CONN. — A 3-story plant will be erected by the American Graphophone Co. Russell R. Meade is superintendent.

BRIDGEPORT, CONN.—Bids will be received shortly by the Bridgeport Compressed Paper Box Co. for a $25,000 factory addition, 2 stories high and 40 x 130 feet in size.

BRIDGEPORT, CONN.—Bids have closed for two brick and steel, 1-story, 50 x 150-foot buildings for pattern and casting storage for the Bullard Machine Tool Co.

MERIDEN, CONN. — The International Casket Hardware Co. has been organized, with a capital of $100,000. Arthur Manning, Manchester, Conn., is president of the new company.

NEW HAVEN, CONN.—The International Leather & Belting Co., New York, which recently acquired property on Clinton street, has awarded to the Sperry Engineering Co. the contract for three factory buildings, one of which will be 50 x 150 feet.

Along the Middle Atlantic Seaboard

ALBANY, N. Y. — Contracts have been awarded for the erection of a 50 x 125-foot machine shop at the plant of George H. Thatcher & Co., manufacturers of cast iron products and gray iron castings. Awards also have been made for alterations to the company's forge shop.

ARVERNE, L. I., N. Y. — Walter H. Goehagen, 147 Remsen street, Brooklyn, will erect a shipbuilding plant here, to include a 200 x 600-foot machine shop and a 200 x 300-foot woodworking shop, to cost jointly about $75,000.

BROOKLYN, N. Y.—The Metal Hose & Tubing Co., 257 Pillary street, is having plans drawn for a $5000 addition to its plant. John Clansitzer, 215 Montague street, is architect.

BROOKLYN, N. Y.—A $10,000 addition will be erected at the plant of N. J. Street, South Eighth street and Kent avenue.

BROOKLYN, N. Y.—A charter of incorporation has been granted to the Rubes Electric Lamp Co., organized with $10,000 to manufacture electric fixtures. The incorporators are A. Wegmann, N. and L. Rubes, 1585 Bedford avenue.

BROOKLYN, N. Y.—The William Harvey Corp., 111 Broadway, New York, is having plans drawn for a $17,000 manufacturing building to be erected here. The William Kennedy Construction Co., 215 Montague street, will be in charge of the construction.

ELMIRA, N. Y.—The Delaware, Lackawanna & Western railroad is having plans drawn for alterations to its roundhouse to cost $5000.

GLENDALE, L. I., N. Y.—James A. McCaffity & Sons Mfg. Co. will erect a 1-story, 30 x 58-foot metal working plant.

NEW YORK.—The Metals Fabricating Co., Inc., has been incorporated with $105,000 capital to manufacture metal products. The incorporators are W. F. Roohan, 99 John street, F. Lightfoot and others.

NEW YORK.—The Hudson Foundry Co. has been organized with a capital of $20,000. The incorporators are J. Mittelman, 27 William street, J. C. Garrett and others.

NEW YORK.—The American Life Savers Mfg. Co. has been incorporated to manufacture scientific instruments with a capital of

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Quality PLUS Service

The whirring of the airplane—the roaring of the fast express—the thundering chug of the rapidly approaching motor truck, all *proclaim the victory of Ohio Steel Castings over "Power"* by proving the ability of these castings to withstand the terrific, racking, straining shocks of the mightiest engines constructed by man.

If you are in need of Tractor, Motor Truck, Automobile or other small castings—castings of a quality and strength fit for the most strenuous service specify *Ohio Steel Castings.*

Let us figure on your requirements.

The Ohio Steel Foundry Co.

Plants

Springfield, Ohio Lima, Ohio Bucyrus, Ohio

$50,000 by M. Watson, P. McCartin and M. Parisi, 42 King street.

OGDENSBURG, N. Y.—All bids on the proposed $50,000 coal pocket for the George Hall Coal & Transportation Co. have been rejected. The structure will be 1 story high and 41 x 135 feet in size. A. M. Suck, Hyde Park, Mass., is architect.

OTISCO, N. Y.—A charter of incorporation has been granted to the Otisco Light & Power Co., capitalized at $10,000, to supply power to Onondaga county. The incorporators of the company are M. A. Phelps, E. T. Harter and B. L. Harter.

EDDYSTONE, PA.—Plans are being drawn for the superstructure for ammunition works No. 2 at the plant being erected by the Baldwin Locomotive Works. Foundation work is already in progress. The plant will cost about $2,000,000.

LANCASTER, PA.—The Rowe Motor Mfg. Co. will build a $35,000 plant addition, two stories high and 120 x 200 feet in size.

PHILADELPHIA. — Estimates are being taken on the construction of a new boat shop and an addition to the existing boat shop at the Philadelphia navy yard.

PHILADELPHIA.—William R. Dougherty has been awarded the contract for the erection of a $21,000 building at the Frankford arsenal. The structure will be 34 x 100 feet.

TACONY, PA. — The Tacony Ordnance Corp. is receiving bids for the construction of a 35 x 85-foot and a 24 x 42-foot building, one story high, at its plant.

TAMAQUA, PA.—The contract for an acid plant, to cost $100,000, to be erected at the local plant of the Atlas Powder Co., was recently awarded to the Austin Co., Philadelphia. The Atlas company has charge of an $8,000,000 powder plant to be erected in Maryland for the government.

TYRONE, PA.—The West Virginia Pulp & Paper Co., 200 Fifth avenue, New York, contemplates the erection of a 1-story addition to its alcohol plant.

CAMDEN, N. J.—A charter of incorporation has been granted to the Titan Automatic Tool Co., capitalized at $1,500,000. Joseph P. Murray, Frank S. Muzzey and F. Stanley Saurman, Philadelphia, are the incorporators.

CAMDEN, N. J.—The American International Shipbuilding Co. plans to build a 2-story, 105 x 135-foot addition to its plant at Sixth and Morgan streets.

CAMDEN, N. J.—The Lutz Co., Inc., of New Jersey, recently organized with a capital of $100,000, has taken over the plant of the Joseph Pedrick Foundry Co. at Twenty-fourth and Hayes avenue, which it will enlarge and equip for the manufacture of castings to be used in making compression tools and machinery. R. A. Rutherford is in charge of the Lutz company's plans for expansion.

EAST ORANGE, N. J.—A charter of incorporation has been granted to the New Jersey Metal Products Co., capitalized at $100,000, to manufacture metal novelties. The incorporators are Harry H. Picking, Charles O. Geyer and L. Mathews.

ELIZABETH, N. J.—A charter has been granted to the American Steel Hardening Products Corp., incorporated with $50,000 capital by C. Addison Swift, Charles Otto Jr., and Samuel Reibel.

HARRISON, N. J.—The Driver-Harris Co. plans to rebuild the portion of its plant recently damaged by fire. Reconstruction plans include the erection of a 3-story, 40 x 200-foot building and a 1-story, 25 x 110-foot building, for the housing of the shipping and insulated spooling departments. The F. H. Ogden Co., Newark, N. J., is the engineer in charge of the work.

JERSEY CITY, N. J.—The Mutual Iron Works, 907 Communipaw avenue, has been incorporated to engage in a general machine shop business with $125,000 capital.

NEWARK, N. J.—Frank Grad is drawing plans for a 1-story, 30 x 95-foot foundry, to be erected by Max Mandle.

WILMINGTON, DEL. — The Wilmington Sugar Refining Co. has purchased as a location for its new refinery 15 acres along the Christiania river.

BALTIMORE.—The C. H. Crook Co., 28 Light street, is having plans prepared for a shipbuilding plant at Locust Point, to replace that damaged by fire recently with a loss of $75,000.

SPARROWS POINT, MD.—The Bethlehem Shipbuilding Corp. has awarded the contract for the erection of a 1-story, 30 x 65-foot and a 30 x 34-foot addition to its plant. The joint cost of the improvements is estimated at $10,000.

NORFOLK, VA. — Benjamin F. Mitchell, architect, is drawing plans for a $50,000 shipbuilding plant. The owner's name is being withheld.

WASHINGTON.—The bureau of yards and docks has plans drawn for a $200,000 substation and frequency changer house.

Activities in the Central States

APPLETON, WIS.—The Northern Boiler & Structural Works, H. H. Timm, manager, will build a 1-story addition to be 100 x 150 feet in size, and to cost $30,000.

BEAVER DAM, WIS.—The Western Malleables Co. has completed a new pattern shop costing about $25,000 to replace the building damaged by fire several months ago.

CLINTONVILLE, WIS.—The Topp-Stewart Tractor Co., which recently purchased two water power sites on the Embarrass river, has awarded contracts for the first dam and hydroelectric plant, designed by Thomas W. Orbison, consulting hydraulic engineer, Appleton, Wis. The steel work will be done by the Northern Boiler & Structural Works, Appleton, and the concrete and mason work by C. R. Meyer & Sons Co., Oshkosh, Wis. The work will cost about $50,000.

HARTFORD, WIS.—The common council is considering the purchase of a 500-horsepower water tube boiler for the municipal light and power plant.

GREEN BAY, WS.—The Green Bay Barker Co., manufacturer of paper and sawmill machinery, will build an addition to its machine shop to be 60 x 120 feet in size.

GREEN BAY, WIS.—The American Hardware Co. has been incorporated with a capital stock of $30,000 by Lawrence Gottfredson, H. J. Bultmann and A. J. Kuitck.

JANESVILLE, WIS.—The Blodgett-Holmes Milling Co. is considering the installation of a larger hydroelectric power plant and new steam-generating facilities for auxiliary and emergency purposes.

MILWAUKEE. — Articles of incorporation have been filed by the Why Electric Manufacturing Co. The capital stock is $15,000 and the incorporators are Albert H. Walker, William F. Horn and Lafayette Yakes.

NEW LONDON, WIS.—C. J. Thompson, city clerk, is receiving sealed bids until March 1 for furnishing and installing one 200 kilowatt direct-connected generator for the municipal light and power plant.

NEW LONDON, WIS.—The plant of the former Kenkel Mfg. Co., wood products, has been purchased by A. M. Mayo & Co., Henry Fuerst and August Krueger, who will make numerous improvements, including the installation of a 100 or 150-horsepower motor generator unit.

OSHKOSH, WIS.—The Universal Foundry Co. has increased its capital from $10,000 to $25,000, to provide for expansion. Robert Ziebell is president.

RACINE, WIS.—The Webster Electric Co., manufacturer of small electric motors, has incorporated its business with a capitalization of $600,000. The incorporators are Walter Brown, P. G. Crewe and John B. Simmons.

SHAWANO, WIS.—Jay C. Bossard, P. J. Nolan and L. B. Woodruff contemplate the establishment of a factory for the manufacture of ensilage cutters and gasoline engines.

SHEBOYGAN, WIS.—The Jenkins Machine Co., 315 North Eighth street, will build a 2-story addition to its machine shop, to be 45 x 60 feet in size.

SHEBOYGAN, WIS.—The J. J. Vollrath Co., manufacturer of enameled sanitary ware, has awarded a contract to William Guenther & Son for the construction of a 1-story brick and steel enameling shop addition, 125 x 210 feet, from plans drawn by W. C. Weeks, architect, Sheboygan. The building will cost about $50,000 and with machinery, equipment, etc., will represent an investment of about $75,000.

SUPERIOR, WIS. — The E. Kane Co., Banks avenue and North Fourth street, is in the market for scrap yard equipment, including a crane, magnet and shears.

THORP, WIS.—The Thorp Electric Light & Power Co. has been incorporated by P. D. Kline, E. C. Dearth and Donald Boyd, Eau Claire, Wis., to take over and operate the electric light and power plant at Thorp. The capital stock is $10,000.

WASHBURN, WIS.—A new finishing plant will be built and other improvements estimated to cost about $100,000 will be made at once at the Barkdale plant of the Du Pont Powder Co.

DETROIT.—The Larned Tool & Die Co. has been chartered with $15,000 capital to design and manufacture tools. The incorporators include William C. Weicke, Charles V. Ketts and H. J. La Bean.

DETROIT.—The Detroit Copper & Brass Rolling Mills, 1350 West Jefferson street, will build a factory.

FLINT, MICH.—Bids will be received until March 5 by the water commissioners for a 15,000,000-gallon, 150-foot total head, geared turbine driven centrifugal pumping unit with

Who Is Responsible If Your Packing Case Is Smashed?

During all the years that the United States has been building up its export trade the responsibility for proper packing has been a moot-question between the exporting houses and the manufacturers.

Knowing that his style of packing serves its purpose for freight delivery in this country, the average manufacturer thinks that the exporting house is super-demanding in requiring special packings for foreign shipments. But no such excellent freight service exists in overseas shipping as prevails on our railroads. The conditions of climate, of ocean transit and of frequent rehandling make it imperative that goods be packed and marked strictly according to instructions.

This subject is of such importance to the welfare of our foreign trade that we have prepared a brief booklet describing conditions in export shipping. We will be glad to send it free to any manufacturer, or his shipping clerk, who wishes to insure safe delivery of his export orders.

FEDERAL EXPORT CORPORATION

115 BROADWAY, NEW YORK

condenser and auxiliaries. E. C. Shoecraft is city engineer.

GRAND RAPIDS, MICH.—A charter has been granted to the Michigan Boiler & Iron Works, capitalized at $10,000.

KALAMAZOO, MICH.—The plant of the Keystone Type Foundry, West Larned street, has been damaged by fire with a loss estimated at $100,000. The building was a 5-story structure.

MARQUETTE, MICH.—The city will build an addition to its hydroelectric plant at Dead river, to cost $75,000. C. Rettalic, city hall, Marquette, is superintendent.

MIDLAND, MICH. — The Dow Chemical Co. will build a 1-story factory, 100 x 150 feet in size, to cost $20,000. The Austin Co., 1430 Penobscot building, Detroit, is architect.

MUSKEGON, MICH.—The plant of the Sargeant Mfg. Co. has been damaged by fire with a loss of $10,000.

SAGINAW, MICH.—The city plans an auxiliary pumping station with two electrically driven centrifugal pumps of 6,000,000 gallons daily capacity, to cost $30,000. H. F. Paddock is city engineer.

WYANDOTTE, MICH.—The Detroit Shipbuilding Co. has let contracts for the erection and equipment of a power house.

CHICAGO.—The Denicke Steel Furniture Co., capitalized at $2500, has been chartered by F. E. Denicke, M. D. Denicke and C. W. Denicke, 53 West Jackson boulevard.

CHICAGO. — The Midwest Steel Products Co., capitalized at $2500, has been chartered by William W. Klein, Samuel Kraus and George Gottrell.

CHICAGO.—William P. Whitney, architect, 122 South Michigan avenue, is planning a manufacturing plant one-story, 65 x 135 feet in size, to cost $8000.

CHICAGO, ILL.—The Harrington & King Perforating Co., J. M. Fuller, president, 512 North Union avenue, will build a 2-story plant, 126 x 312 feet in size, to cost $100,000.

CHICAGO.—The Crane Co. will build a 2-story building, 80 x 100 feet and make alterations to other structures at the Corwith plant, including a steel bridge and a reinforced concrete tunnel. R. T. Crane Jr., is president, Kedzie avenue and Forty-first street.

CHICAGO.—The Ilg Electric Ventilating Co. has bought a site at Elston avenue and Snow street and will build a plant costing $750,000 in units 60 x 300 feet in size, with 80-foot light courts.

DECATUR, ILL.—The Leader Iron Works is planning improvements and an addition to its machine shop to be 50 x 200 feet in size. Aschauer & Waggoner, 225 Citizens Title & Trust building, are architects.

LOCKPORT, ILL. — The Coal Products Mfg. Co. will build a benzol plant. The Wilputte Coke Oven Corp., care G. B. Binington Coke Products Works, Lockport, and 6 Church street, New York city, is architect and engineer.

PEORIA, ILL.—The Peoria Foundry Co., 1306 South Washington street, recently incorporated, will establish a foundry. J. Fitzgerald and J. F. Hadank are incorporators.

EVANSVILLE, IND.—The Hercules Buggy Mfg. Co. will build an addition to its gas engine factory to be 180 x 1000 feet in size. J. D. Craft, Martin avenue and Indiana street, is manager.

INDIANAPOLIS, IND.—The Automotive Parts Co., capitalized at $100,000, has been chartered to manufacture automotive parts and appliances by George W. Cummings, Lawrence G. Cummings and William C. Jones.

AKRON, O.—Contracts will be awarded shortly by Franz Warner, architect, Hippodrome building, Cleveland, for a laboratory, boiler house and other buildings to be erected by the Northern Ohio Tractor & Light Co., at an aggregate cost of $200,000.

BEDFORD, O.—The Owen Tire & Rubber Co. will start work shortly on the excavation for its new plant to cost $125,000. The company, which maintains offices at 1900 Euclid avenue, Cleveland, plans to purchase material and do its own construction work.

CANTON, O.—The Van Kirk-Carroll Coal Co. has been organized by E. B. Van Kirk, M. E. Jobe and William I. Zink to develop 1000 acres of coal land in Carroll and Tuscarawas counties.

Trade Announcements

THE Westinghouse Electric & Mfg. Co. has announced the removal of its Phoenix branch to the Immigration building, Tucson, Ariz. The southwestern representatives are J. H. Knost and W. G. Willson.

The A. R. Williams Machinery & Supply Corp., Toronto, Ont., has opened a branch sales office at 402 Fidelity building, New York.

A transfer of its general purchasing office from St. Louis to the main office, 165 Broadway, New York, has been made by the American Car & Foundry Co. W. H. Hedgcock is general purchasing agent.

The name of the Midland Machine Co., Detroit, has been changed to that of the Grimes Molding Machine Co.

A branch office has been opened in Chicago by the Latshaw Steel & Metal Products Corp., New York. The Chicago branch is located in the Railway Exchange building. Marvin W. Singer is in charge.

The Pittsburgh office of the Reliance Iron & Coke Co., of which Ray S. Fox is manager, has been moved to 1226 Park building, in that city.

CINCINNATI. — The Cincinnati Traction Co. has applied to the city for a franchise to permit the extension of its lines, through Pleasant Ridge and Kennedy Heights, and to build a power house for operating these extensions. Cost of the improvements is estimated at $75,000.

CLEVELAND.—The Glenn L. Martin Co. has purchased a tract of land on Wayside avenue, on which it will build a plant for the manufacture of airplanes. The contract has been awarded to the Crowell-Lundoff-Little Co., 1951 East Fifty-seventh street. Cost of the structure is estimated at $200,000.

CLEVELAND.—A charter of incorporation has been granted to the Breyley Automatic & Portable Car Stop Co., capitalized at $25,000. Frank S. Nay, James U. Duffy and others are interested.

CLEVELAND.—Plans are being prepared by Ernest McGeorge, engineer, Leader-News building, for a 1-story, 80 x 400-foot addition to the plant of the Chandler Motor Car Co., East 131st street and St. Clair avenue. The cost of the building is estimated at $80,000.

CLEVELAND.—Plans are being prepared by the Austin Co., 14230 Euclid avenue, for a factory to be built by the Warner Gear Co., Muncie, Ind. The building will be 1-story high and 135 x 450 feet in size. R. P. Jackson, at the company's Muncie plant, is in charge.

CLEVELAND.—The L. N. N. Foundry Co. has been chartered with a capital of $20,000 by H. H. Neuman and C. E. Lyall.

CLEVELAND.—A charter of incorporation has been granted to the Unit Power Wheel Co., capitalized nominally at $1000, in which Don B. Alexander and Anson Henry are interested.

COLUMBUS, O.—Plans are being drawn by Stribling & Lum, 85 North High street, for a 1-story brick machine shop to be built by the Okey Machine Co., Maughton street. The building will be 80 x 100 feet in size, of fireproof construction. Bids will be closed shortly.

DAYTON, O.—The Dayton Screw Co. has received a permit to erect an addition to its factory at Second and Webb streets, to cost $2000.

FREMONT, O.—Construction work has begun on the addition to the Hotz foundry on Wolf avenue, to be 60 x 60 feet in size. Contract has been awarded to Radde, Rink & Ehlers.

HAMILTON, O.—The Hamilton Furnace Co., Coke Otto, has awarded to the Hunkin-Conkey-Construction Co., Cuyahoga building, Cleveland, the contract for the erection of an addition to its plant to cost between $500,000 and $750,000. Construction will include an ore bridge and a car dumper.

LORAIN, O.—The Lorain Electric Co. plans to erect an additional power house as soon as the one under process of construction at the foot of Oberlin street is completed. The second plant will be built on a site adjoining the other and will be equipped to produce 12,500 horsepower. J. B. Johnson, Elyria, O., is general manager of the company.

MASSILLON, O.—The Melvin-Sailor Co., Clay street, will shortly begin work on the erection of a new plant to be 1-story high, and 40 x 150 feet in size. John Melvin is manager of the company.

NEWARK, O.—The Blair Motor Truck Co. plans to make extensive additions to its plant. The concern will be taken over shortly by a new company being organized with $1,500,000 capital, of which J. D. Potter, formerly vice president of the Kilburn & Jacobs Mfg. Co., is president.

TOLEDO, O.—The Toledo Electric Steel Organization, Buckeye street and Seek avenue, is in the market for a 12-inch bar rolling mill with drive, three water tube boilers, a second-hand electric furnace and three power hammers. S. Stuart Green, superintendent, is in charge.

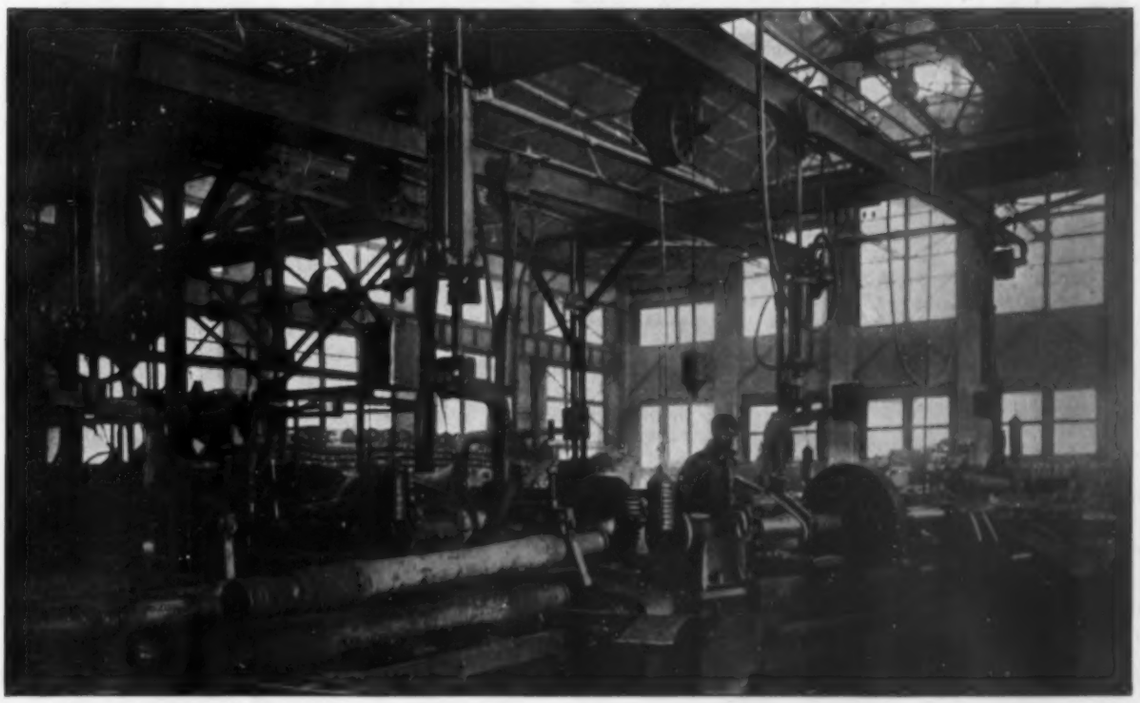
YOUNGSTOWN, O. — The Independent Motor Co., Port Huron, Mich., plans to remove its plant to this city. A new company has been formed with $300,000 capital to take over the company's business. A. F. Frantz, Detroit, is in charge.

LEXINGTON, KY.—The Garey Coal Co. will receive bids in April for machinery to be installed at the company's new mines at Chavis, Ky.

LOUISVILLE, KY.—Damage of approximately $30,000 was done to the plant of the

Do you wish to reduce your labor force 50%? ¶ Do you wish to reduce your production cost 20%? ¶ Do you wish us to make a special analysis of your problem—it may be we can devise special equipment to accomplish highly efficient results.

WE HAVE DONE IT FOR OTHERS



THE ARNOLD COMPANY
ENGINEERS—CONSTRUCTORS
ELECTRICAL—CIVIL—MECHANICAL
105 South LaSalle Street CHICAGO

Say you saw it in THE IRON TRADE REVIEW

Voss Table Co. in a fire which gutted the boiler room.

NORTONVILLE, KY.—The Norton Coal Mining Co. has asked for bids on an addition to its power plant and other buildings, and will shortly ask bids on machinery requirements.

OWENSBORO, KY.—For the purpose of increasing its business and enlarging its manufacturing capacity the Anglo-American Mill Co., manufacturer of milling machinery, has increased its capital stock from $650,000 to $1,000,000. The company manufactures portable milling machinery, and requires some new equipment.

PADUCAH, KY.—The city plans the installation of two 300-horsepower boilers in the municipal lighting plant.

WINCHESTER, KY.—The city is planning to construct a waterworks system. E. B. McKay, city engineer, is in charge.

PARKERSBURG, W. VA.—A charter of incorporation has been granted to the Marietta & Parkersburg Bridge Co., capitalized at $250,000, to build a bridge between Marietta, O., and Parkersburg. S. E. Miller Fairmont, W. Va., is in charge.

Up and Down the Pacific Coast

DAVENPORT, WASH.—The Intermountain Power Co. has made application to the county commissioners for a franchise to construct a 2-pole transmission line in Lincoln county to be 70 miles long.

SEATTLE, WASH. — The Western Drop Forge Co. is building a 1-story factory, 45 x 56 feet, at 301 Horton street, to cost $3500.

SPOKANE, WASH.—The Clarkson Mfg. Co., manufacturer of iron and steel products, will build a plant to cost $100,000.

TACOMA, WASH. — Commissioner H. F. Gronen is having an ordinance prepared for submission to the voters April 2, on the purchase of a site and construction of a power plant to cost about $5,000,000.

VANCOUVER, WASH. — The Vancouver Galvanizing Works has been incorporated with a nominal capital of $1000 by F. E. Kennedy, M. W. Odell and Dan E. Hardin.

WALLA WALLA, WASH.—The Rickard Wheel Co. has been organized with a capital of $100,000 by L. J. Rickard and others. An automobile wheel recently invented by Mr. Rickard will be manufactured.

YAKIMA, WASH. — The county commissioners have awarded a contract to the Illinois Steel Bridge Co. for the construction of a bridge over the Yakima river, at the contract price of $30,699.

BURNS, OREG. — Promoters of Boise, Idaho, will construct a 33-mile line of railroad between this place and Crane, Oreg.

PORTLAND, OREG.—The commission of public docks has authorized the purchase of two additional locomotive cranes, one 10 to 15 tons capacity, the other 30 to 35 tons capacity.

MARTINEZ, CAL.—Plans are being prepared for a waterworks system for which $178,000 in bonds has been authorized. A pumping plant, reservoir and distributing system will be included.

OAKLAND, CAL.—The Aluminum Products Co. is building an addition to its plant on East Eleventh street.

PITTSBURG, CAL. — The Great Western Electro-Chemical Co. will build an addition to its plant.

SAN FRANCISCO.—W. H. Berry is building a 2-story concrete machine shop at Howard and First streets, to cost $25,000.

SAN FRANCISCO.—The Main Street Iron Works, 163 Main street, is building a plant at Seventh and South streets

New Business in Eastern Canada

NANAIMO, B. C.—The Nanaimo City Gas Co., 59 Commercial street, is having plans prepared for the erection of an addition to its plant and will install new machinery to cost $35,000. W. W. Lewis is manager.

NELSON, B. C.—The Consolidated Mining & Smelting Co., Trail, B. C., contemplates establishing a smelter here.

PRINCE RUPERT, B. C.—W. R. Hinton, general manager in the northwest for the Grand Trunk Pacific railroad, announces that the road will build a brick railway station, machine shops and roundhouse near Cameron Cove, to cost $250,000.

VANCOUVER, B. C.—The Wallace Shipyards, Ltd., Esplande east, has awarded to Hodgeson & King, 1573 Main street, the general contract for remodelling and building extensions to its plant to cost $100,000.

VANCOUVER, B. C.—The British-American Shipbuilding & Engineering Co., Hitsilano Reserve, is having plans prepared for the erection of a shipbuilding plant. J. A. Sears is president of the company.

VICTORIA, B. C.—The Victoria Shipbuilding Co. will build an addition to its plant to cost about $100,000. J. H. Price, care of the Cameron-Genoa Mills, Ltd., Old Indian Reserve, Victoria, B. C., is president.

VICTORIA, B. C.—The Western Union Telegraph Co. is making preparations for the erection of a 1-story concrete terminal cable house, to be erected on Dalas road, at a cost of $40,000. F. H. Blashfield is local manager.

HAMILTON, ONT.—The Canadian Cotton Co., James street north, is building an addition to its foundry to cost $60,000.

HAMILTON, ONT.—The United Gas & Fuel Co. has submitted a proposition for the installation of municipal coke ovens to the city council. Owing to the fuel shortage, the council favors the project. The proposed plant will cost $3,335,000.

OMEMEE, ONT.—Charles Parsons & Son, leather manufacturers, 79 Front street east, Toronto, Ont., will make alterations and additions to their plant here, to cost $100,000.

OTTAWA, ONT.—Dr. J. A. Armstrong, Toronto, Ont., who is interested in the Oakoal Co. recently incorporated, proposes to erect a plant here to cost $60,000, for the manufacture of fuel from refuse.

ST. THOMAS, ONT.—The gas committee proposes to make improvements to the municipal gas plant and to install additional equipment, to cost in all about $40,000. Alderman Handford is chairman of the committee.

TORONTO, ONT.—The Electric Insulation & Varnish Co., Ltd., has been incorporated to manufacture paints, varnish, etc., with $60,000 capital. John Whitfield, James G. Shaw, Joseph Montgomery and others are interested.

TORONTO, ONT.—The Toronto Laundry Machinery Co., 1951 Dundas street west, engaged in the manufacture of munitions, whose plant was recently damaged by fire with a loss of $100,000, has awarded the contract to Brown & Cooper, Ltd., 297 Carlton street, for the erection of a manufacturing plant to cost $15,000.

TORONTO, ONT.—Permits for the plant to be built by the Dominion Shipbuilding Co. at the foot of Bathurst street, have been granted by the city architect. The plant when completed will cost $2,500,000. The foundation of the plant, which runs along the bay front from Bathurst street to Spadina avenue, is under way.

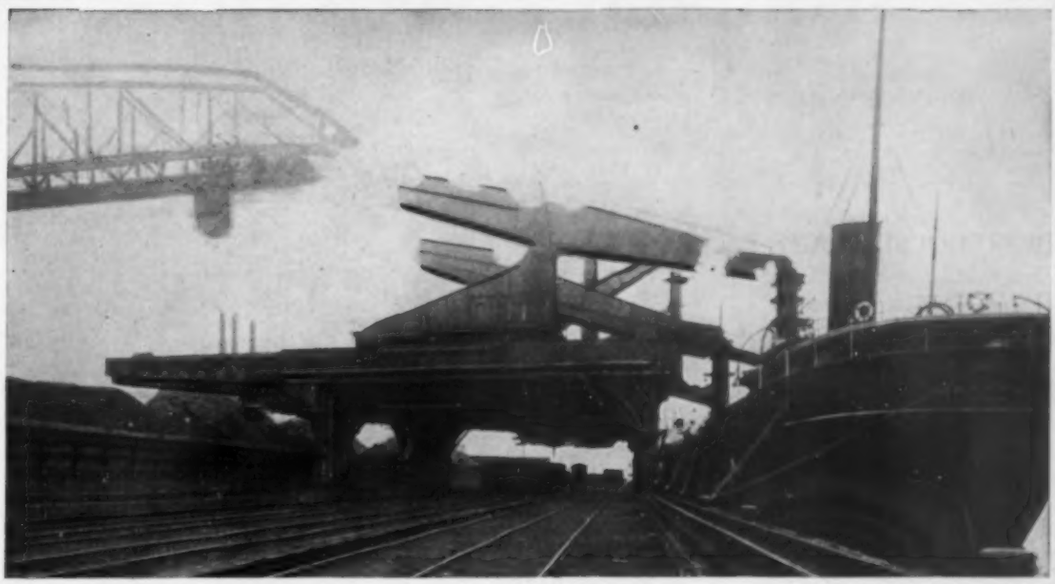
ARMAGH, QUE.—The town council will call for bids about March 15 for the erection of a waterworks plant to cost $40,000. Gouvin & Beauchemin, 147 de la Montagne street, Quebec, Que., are the engineers in charge.

POINT AUX TREMBLES, QUE. — The Dominion Cement Co., 92 Notre Dame street east, has secured a site and will build a cement plant to cost $100,000. J. A. Vinet is secretary and treasurer of the company.

BRIDGETOWN, N. S.—A. L. Beeler has leased a site along the North shore of the Annapolis river on which he will erect a shipbuilding plant.

DARTMOUTH, N. S.—The Canadian Carbonate Co., 132 Hollis street, Halifax, N. S., is building a manufacturing plant at Dartmouth, to cost $100,000. The Rhodes-Curry Co., Ltd., Windsor street, Halifax, is the general contractor.

HALIFAX, N. S.—The Halifax Graving Dock, Granville street, has awarded to S. M. Brookfield, Ltd., the contract for additions and repairs to the company's graving dock, to cost about $100,000.



Steel Giants Do Work of Thousands of Men

All of the large modern ore docks constructed during the last six years have been equipped with **Hulett Boat Unloaders.** These machines have become a standard for unloading Iron Ore, and ***they are equally well adapted for unloading Coal.***

Hulett Unloaders are built in the following sizes and guaranteed capacities: **For Ore:** *17-Ton Buckets*, capacity 1,250,000 tons per season; *15-Ton Buckets*, capacity 1,000,000 tons per season; *10-Ton Buckets*, capacity 750,000 tons per season. **For Coal:** *8-Ton Buckets*, capacity 500,000 tons per season.

Hulett Unloaders require (1) fewest number of men, (2) lowest labor cost per ton, (3) lowest power cost per ton, (4) lowest maintenance cost per ton.

Complete Ore and Coal Handling Stations, equipped with Boat Unloaders, Car Dumpers, Rehandling Bridges, etc., are a specialty of The W-S-M Company.

Bulletins are in preparation on Ore and Coal Handling Machinery. *Send for your copies.*

The four Unloaders pictured above constitute the Pennsylvania Railway's Whisky Island installation at Cleveland, Ohio.

Principal Products of The W-S-M Company
Steel Plant Equipment:
Manipulators, Furnaces, Charging Machines, etc.
By-Product Coke Oven Machinery.
Shipyard Cranes.
Hoisting and Mining Machinery.
Ore and Coal Handling Machinery.
Special Large Cranes.
Gas Producers, Gas Valves.
Hydraulic Turbines.
Johnson Hydraulic Valves.
Steel Castings.

WELLMAN SEAVER MORGAN COMPANY
CLEVELAND
OHIO U.S.A.

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

WAREHOUSE PRICES

Steel bars, Chicago	4.10c
Steel bars, Cleveland	4.035c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.10c
Steel bars, New York	4.095c
Steel bars, St. Louis	4.17c
Steel bars, Cincinnati	4.085c
Steel bars, St. Paul	4.22c
Steel bars, Buffalo	4.05c
Iron bars, Buffalo	4.65c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	3.985c
Iron bars, Detroit	4.75c
Iron bars, St. Louis	4.17c
Iron bars, Cincinnati	4.085c
Iron bars, Philadelphia	4.50c
Iron bars, New York	4.659c
Shapes, Chicago	4.20c
Shapes, Detroit	4.185c
Shapes, St. Louis	4.27c
Shapes, St. Paul	4.32c
Shapes, New York	4.195c
Shapes, Cleveland	4.135c
Shapes, Philadelphia	4.20c
Shapes, Buffalo	4.15c
Shapes, Cincinnati	4.185c
Plates, Buffalo	4.40c
Plates, Chicago	4.45c
Plates, Detroit	4.435c
Plates, St. Louis	4.52c
Plates, St. Paul	4.57c
Plates, New York	4.445c
Plates, Cleveland	4.385c
Plates, Philadelphia	4.45c
Plates, Cincinnati	4.435c
No. 10 blue anl. sheets, Chi.	5.45c
No. 10 blue anl. sheets, Cleve.	5.35c
No. 10 blue anl., Buffalo	5.40c
No. 10 blue anl., sheets, St. L.	5.52c
No. 10 blue anl. sheets, Cinci.	5.435c
No. 10 blue anl. sheets, St. Paul	5.57c
No. 10 blue anl. sh., Detroit	5.435c
No. 28 black sheets, Chgo.	6.45c
No. 28 black sheets, Cleve.	6.35c
No. 28 black sheets, Cinci.	5.45c
No. 28 black, Detroit	6.435c
No. 28 black sheets, St. L.	6.52c
No. 28 black sheets, St. Paul	6.57c
No. 28 galv. sheets, Chgo.	7.70c
No. 28 galv. sheets, Cleve.	7.60c
No. 28 galv. sheets, Cinci.	6.635c
No. 28 galvanized, Detroit	7.685c
No. 28 galv. sheets, St. L.	7.77c
Hoops, Cleveland	4.885c
Hoops, Detroit	4.935c

IRON AND STEEL SCRAP

STEEL WORKS USE
(Gross Tons)

Bundled sheets, Pittsburgh	$22.00 to 23.00
Bundled sheets, Cleveland	24.50 to 25.25
Bundled sheets, Buffalo	22.00 to 24.00
City wrought, short, N. Y.	27.50 to 28.00
Frogs, switches, guards, St. L.	29.50 to 30.00
Frogs, switches, guards, Chgo.	30.00
Heavy melting steel, Pitts.	30.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	30.00
Heavy melt'g steel, Cleveland	30.00
Heavy melting steel, Cinci.	27.00 to 27.50
Heavy melt'g steel, east. Pa.	30.00
Heavy melting steel, N. Y.	29.50 to 30.00
Heavy melting steel, St. L.	29.50 to 30.00
Heavy melting steel, Birming.	25.00 to 27.50
Hydraulic press. sheets, Cleve.	28.50 to 29.50
Hydraulic press. sheets, Pitts.	27.00 to 28.00
Hydraulic press. sheets, Chgo.	27.00 to 27.50
Low phos. steel, Buffalo	40.00
Low phos. steel, Pittsburgh	40.00
Low phos. steel, eastern Pa.	40.00
Shoveling steel, Chicago	30.00
Shoveling steel, St. Louis	29.50 to 30.00
Steel rails, short, Chicago	34.50 to 35.00
Steel rails, short, Cleveland	32.00 to 33.00
Steel rails, short, St. Louis	34.00 to 35.00
Steel rails, old, Birmingham	28.00 to 30.00
Stove plate, Cincinnati	19.50 to 20.00
Stove plate, St. Louis	20.50 to 21.00
Stove plate, N. J. points	22.50
Stove plate, Birmingham	19.00 to 21.00
Stove plate, Buffalo	25.00
Stove plate, eastern Pa.	23.00 to 24.00
Stove plate, Cleveland	21.00 to 22.00
Stove plate, Pittsburgh	20.00 to 21.00
Cast iron borings	11.00 to 12.00

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$22.00 to 23.00
Boiler plate, cut, No. 1, St. L.	24.50 to 25.00
Bundled sheets, Cincinnati	20.00 to 20.50
Knuckles, coup., Chicago	35.00
Knuckles, coup., St. Louis	31.00 to 31.25
Springs, Chicago	35.00
Stove plate, Chicago	23.00 to 24.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Philadelphia	$3.27
New England	3.77
Brooklyn, Jersey City, Newark	3.52
Birmingham, Ala., to:	
Boston	6.00
Cincinnati	2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	6.00
Philadelphia (r. and w.)	5.25
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.15
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis- St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	16.0 cents
Baltimore	18.0 cents
Cleveland	13.5 cents
Cincinnati	17.0 cents
Chicago	21.5 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	82.5 cents
St. Louis	27.0 cents
New Orleans	30.0 cents
Birmingham	45.0 cents
Pacific coast (all rail)	75.0 cents
Pacific coast (tin plate)	75.0 cents

IRON MILL USE
(Gross Tons)

Busheling, No. 1, Cleveland	29.00 to 30.00
Busheling, No. 1, Buffalo	31.00
Busheling, No. 2, Buffalo	22.00 to 24.00
Busheling, No. 1, Pittsburgh	32.00
Cast borings, New York	17.00
Cast borings, eastern Pa.	20.00
Cast borings, Cleveland	20.00
Cast borings, Buffalo	19.00 to 20.00
Cast borings, Pittsburgh	20.00
Cast borings, Birmingham	13.00 to 15.00
Cast borings, Chgo.	18.50 to 19.00
City wrought, long, N. Y.	32.00 to 32.50
Cut forge, Chicago	33.50 to 34.50
Forge flashings, small, Cleve.	26.50 to 27.00
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, Eastern Pa.	27.50
Grate bars, Buffalo	25.00
Grate bars, Cleveland	21.50 to 22.50
Grate bars, N. J. points	22.50
Iron axles, Pittsburgh	42.00 to 44.00
Iron axles, Cincinnati	43.00 to 43.50
Iron axles, Cleveland	47.50
Iron axles, eastern Pa.	47.50
Iron axles, Chicago	47.50
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	39.00 to 40.00
Iron rails, Buffalo	37.00 to 38.00
Iron rails, Cincinnati	32.00 to 32.50
Iron rails, St. Louis	34.00 to 35.00
Iron rails, Cleveland	35.00
Machine turnings, Cleve.	20.00
Machine turnings, Buffalo	18.00 to 18.50
Machine turnings, N. Y.	16.50
Machine turnings, Pitts.	20.00
Machine turnings, east. Pa.	19.50 to 20.00
Machine turnings, Birming.	17.50 to 19.00
Machine turnings, Chicago	18.50 to 19.00
Pipes and flues, Cleveland	25.50 to 26.50
R. R. mch. cast, No. 1, Buff.	35.00
R. R. wrgt. No. 1, Buffalo	35.00
R. R. wrgt., No. 1, east, Pa.	35.00
Railroad wrgt., No. 1, Cleve.	35.00
R. R. wrought, No. 1, Pitts.	35.00
Railroad wr'ght, No. 1, Chgo.	35.00
Railroad wr'ght, No. 2, Chgo.	33.50 to 34.50
R. R. wrgt. No. 1, Birming.	27.00 to 30.00
Wrought pipe, Buffalo	29.00
Wrought pipe, eastern Pa.	30.00 to 32.00
Wrought pipe, New York	30.50

(Net Tons)

Angle bars, iron, Chicago	$37.50 to 38.00
Angle bars, steel, St. Louis	34.50 to 35.00
Arch bars & transoms, St. L.	42.00 to 42.50
Arch bars & transoms, Chgo.	38.00 to 39.00
Busheling, No. 1, Chicago	25.50 to 26.50
Busheling, No. 1, Cincinnati	24.00 to 24.50
Busheling, No. 1, St. Louis	26.50 to 27.00
Busheling, No. 2, Chicago	18.00 to 19.00
Cast borings, Cincinnati	15.50 to 16.00
Cast borings, St. Louis	17.00 to 17.50
Iron axles, St. Louis	42.00 to 42.50
Iron axles, Chicago	47.50
Machine turnings, Cinci.	15.50 to 16.00
Machine turnings, St. L.	17.50 to 17.85
Pipes and flues, Chicago	24.00 to 25.00
Pipes and flues, St. Louis	26.25 to 26.75
Railroad wrgt., No. 1, Cinci.	30.00 to 30.50
Railroad wrgt., No. 1, St. L.	31.00 to 31.25
Railroad wrgt., No. 2, St. L.	30.00 to 30.40

IRON OR STEEL WORKS USE
(Gross Tons)

Axle turnings, Cleveland	$24.00 to 25.00
Axle turnings, Buffalo	26.50 to 27.00
Shafting, New York	37.50 to 38.00
Shafting, eastern Pa.	45.00 to 47.50
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	45.50 to 46.00
Steel car axles, Buffalo	45.00 to 47.00
Steel car axles, Cleveland	45.00
Steel car axles, Pittsburgh	40.00 to 42.00
Steel car axles, eastern Pa.	47.50
Steel car axles, Chgo.	47.50

(Net Tons)

Shafting, St. Louis	42.00 to 42.50
Steel car axles, St. Louis	42.00 to 42.50

IRON FOUNDRY USE
(Gross Tons)

Car wheels, (iron), Pitts.	$30.00
Car wheels, (steel), Pitts.	33.00 to 35.00
Car wheels, eastern Pa.	30.00
Car wheels, Buffalo	30.00
Car wheels, Chicago	30.00
Car wheels, St. Louis	29.50 to 30.00
Car wheels, Birmingham	25.00 to 30.00
Car wheels, Cleveland	30.00
Tram car wheels, Birming.	21.00 to 25.00
Cast, No. 1, eastern Pa.	34.00 to 35.00
Cast, No. 1, Birmingham	25.00 to 26.00
Cast, 1, machy. N. J. points	29.50 to 30.00
Cast No. 1, Cleveland	30.00
Cast, 1, heavy, N. J. points.	29.50 to 30.00
Cast, 1, machy., N. J. points	30.00 to 31.00
Cast No. 1, Chicago	32.00 to 33.00
Cast, No. 1, Pittsburgh	28.00 to 29.00
Malleable, Cincinnati	30.00 to 35.00
Malleable, Cleveland	30.00 to 35.00
Malleable, Buffalo	30.00 to 35.00
Malleable, Pittsburgh	30.00 to 35.00
Malleable, east. Pa.	30.00 to 35.00
Malleable, Chgo.	30.00 to 31.00

(Net Tons)

Cast, No. 1, Cincinnati	26.00 to 26.50
Cast, No. 1, St. Louis	26.50 to 27.00
Malleable railroad, St. Louis	26.25 to 26.75
Malleable agricultural, Chgo.	24.00 to 25.00
Malleable agricultural, St. L.	26.50 to 26.75

MISCELLANEOUS USES
(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$35.00
Reroll. rails, 5 ft. & ov., Chgo.	35.00
Reroll. rails, 5 ft. & ov., E. Pa.	35.00
Reroll. rails, 5 ft. & ov., St. L.	34.00 to 35.00
Reroll. rails, 5 ft. or over, Cleve.	33.00
Rerolling rails, long, Birming.	37.50 to 38.50
Locomotive tires, Chgo.	42.50 to 43.50

(Net Tons)

Boiler punchings, Chicago	32.50 to 33.50
Locomotive tires, St. Louis	39.50 to 40.00